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\$2.98

THIS BOOK BELONGS TO

**ROBERT SILBERGLIED**

HARVARD UNIVERSITY

BIOLOGICAL LABORATORIES

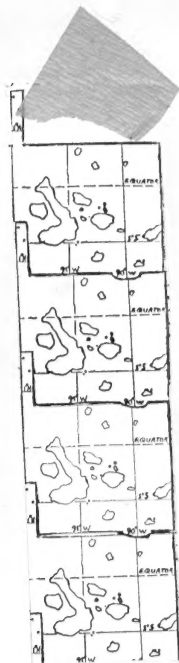
16 DIVINITY AVENUE

CAMBRIDGE, MASS. - U.S.A. 02138

CLASS OF \_\_\_\_\_

HARVARD COOPERATIVE SOCIETY  
CAMBRIDGE, MASS.





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15 Feb. 1970

Boston → N.Y.C. (Flight #71, Northeast)

7<sup>45</sup> AM scheduled flight left about 8<sup>30</sup> AM, arrived in N.Y.C. about 9<sup>30</sup>; changed terminals by taxi. Cab let me + pkgs off on wrong side of ramp.

N.Y.C. → Miami (Flight #11, Eastern)

10<sup>00</sup> AM flight (scheduled) was iced in, delayed, left 3<sup>00</sup> PM, arrived in Miami 5<sup>30</sup> PM. Missed our scheduled Apsa flight (#71).

Frank made arrangements for flight #83 tomorrow.

Checked baggage at airport, except photographic stuff;

Eastern put us up for night, meals (\$3.50 dinner, \$1.50 breakfast, \$2.25 lunch allowed), taxi; Eastern also paid for telegram

to consulate in Georgetown. (Helped by Mr. Frank Davis, #24, Miami)

EXPENSES: Left Cambridge with \$750.<sup>00</sup> in traveler's checks  
 104.<sup>20</sup> in cash  
 Σ \$854.<sup>20</sup>

Callahan Travel — airport (w/ Bob Horvitz, 2/pkgs)	.50
Porter in Boston, tip	2.00
Cab at Kennedy, N.Y.C.	8.00
Porter in Kennedy, N.Y.C.	3.00
Porter in Miami (to claim check)	3.00
Dinner in Miami (addition to Eastern's coverage)	1.40
Portland to F.O. Wilson	.05
	<hr/> 17.95



16 Feb. 1970

Miami, at Airport Inn. Called photographic places - couldn't get Rolux device.  
 Taxi: picked up Frank's Polarizing filter (67 mm, tiffen, \$40<sup>33</sup>/<sub>15 cent</sub>) plus  
 for myself, (88A filter, redd, hypo-check). Went from hotel → photographic  
 place → hotel → airport. Picked up baggage; after having tickets  
 validated the baggage was checked (total = 160 kilos for all baggage,  
 80 allowed free for 4 people; so 80 overweight, at \$1.81 per kilo, =  
 \$144.80. Total weight of my baggage, not including 2 suitcases  
 of photographic equipment, was 101 kilos). We missed the  
 lunch that Eastern would have paid for. I bought the  
 pens and notebooks with which I originally recorded this info!

Miami → Guayaquil. Left Miami 2<sup>00</sup> PM, arrived Guay. 8<sup>15</sup> PM.

(Schedule [times local, PM]: Miami [2:00] → Panama City-Balboa [4:35-5:35]

→ Cali [6<sup>45</sup>-7<sup>35</sup>] → Guayaquil [8<sup>40</sup>-?] → Lima [?] ]

Took photos of Cali from air at night (2, 1/5 + 1/50 @ f/11.4 on EH)

Met at airport by official from consulate, who got us through  
 customs without inspection. Baggage was stored at American  
 consulate overnight. The official (Segundo Rosero) had waited  
 the night before, 8-12 PM.; telegram sent from Miami had  
 arrived too late [re. p. 5]. Segundo arranged for taxicab + driver  
 to help us find hotel, and same driver picked us up at 7<sup>00</sup> AM  
 the following day. Segundo promised to meet us at airport at  
 8<sup>00</sup> PM the following day. At this time I discovered loss of  
 portfolio - left on plane near window by arm of seat. I filled  
 out a Branniff certificate for loss. (Contents of portfolio: re. p. 7)

Drove around Guayaquil looking for a hotel. The driver was very  
 helpful and we found a place, Pension "Helbig", where Frank

had stayed before; it's been used by Peace Corps volunteers.  
 Several other hotels didn't have enough room. (Frank communicates  
 quite well with hands and fragmentary Spanish.) The place  
 was on the 3rd floor of a dilapidated building - very hot and  
 humid; many mosquitoes. Also *Periplaneta* sp., *Blattella ger-*  
*manica*, *Anopheles* (also at airport), spiders, termites, cicad-  
*ellids*. Washroom was at the end of the hall. Had a  
 cerveza (beer) at hotel (Frank had changed \$US to sucre  
 at airport before we left - got it from workers there.  
 Frank tipped "for them all" - got hissed!). We're all  
 tired and achey - my arms and shoulders ache from  
 camera cases; hands are calloused. Robin is still  
 recovering from hernia operation, can't carry much.

#### CONTENTS OF PORTFOLIO LEFT ON PLANE:

Stationery, stamps, carbon paper, U.S. stamps, Customs info.  
 Letter to T. Eisner, <sup>(with copy)</sup> with *Hypericum* data, UV structure paper  
 Copy of card sent to E.O. Wilson, (16 Feb)  
 Copy of letter to Eastern Airlines <sup>general</sup> (incompetence; help of Mr. Davis)  
 List of items contained in numbered pieces of luggage.  
 Tooth brush and shaver  
 Letters of introduction from E.O. Wilson to Roger Perry and "to whom..."  
 Spectrophotometric data on Eastman White Standard; article <sup>on white standards</sup> by Billmeyer.  
*Cissites* data, *Xylocopa* records, from Hurd and Linsley



Frank suggests we all write down, before we get to Galapagos, our expectations of the islands' appearance, etc. I write "hot and humid, with dry coastal lowlands much like the Arizona desert. Highlands, transition zone similar to Devil's Garden, Florida. In neither can one work without  $H_2O$ ."

# EXPENSES

Breakfast in Miami (additional to coverage by Eutecton)	.25
Telephone calls (Photographic places in Miami)	3.40
Taxi in Miami (Hotel → Photo stores → Hotel → Airport)	13.00
Photographic equipment (hyper-check, film 88A, excelsior)	3.90
Porter in Miami (claim check → San American)	1.00
Baggage overweight	144.80
Pens and notebooks	2.34
Drinks on plane (Frank's and my own)	1.00
	<u>\$ 169.69</u>

(Paid for by R. Smith) Claim check for baggage \$4.90

(Paid for by Frank Sullivan) Tips and cab fare in Guayaquil 80.00 sucres  
Rooms + beer at Pension "Helbig" 210.00 sucres  
[Frank got sucres at 95% rate]

17 FEB. 1970

17 Feb 1970

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Woke hot & sweaty - didn't sleep much, many mosquitoes, read some papers. Virages had 1/14. At 22 hrs. 11 dogs very humid - rain fell all night, overcast AM. Trip has been very cloudy so far.

Went to airport, Frank got car. @ airport official told me plane full, not > 20 lbs. passengers! After much waiting, several officials (Mr. Segundo Riera, Sr. Mr. Amado) arrived; tried to arrange things. Loaded all onto car but in end only 3 people & 1 dog went.

Here we all are in a plane headed for the Guaymas, with all equipment back in Guaymas. (no post, I managed to grab my camera case w/ B&W, Min. & Type 6c - but all film, Minilux & P&W, boxes of lenses, accessories, clothing, cloth equipment, a experimental equipment to empty gear there in Guaymas). Most dirty. Finally - we will due to wait till then. (changed 500 to 1000 @ airport)

Flight out good. 1st near some birds at Frankfurt place, cloudy but nice views of Chetumal. 2nd landings, 5 Caba on RR line (4 hrs) w/ 5 SA film @ F4, 1/25, 800' sec. 3rd some birds off Monument of St. Ignace by Roca. Some better pictures to end of 1st. 4th landings by animal block. Trip is slowly in AM & clouds but not real soil & humid prof. notes, granitic trees instead of yucca & chachapalms. Very hot & dry @ airport, no drinking water, people going on water all night, taken to drink by truck. We went back to dock, our luggage went out on the line. A cruise ship @ the docks & (junkies) SAVE FOR 2000 (40 pesos TR)



...buff. 300y presumed as well. Not the same as

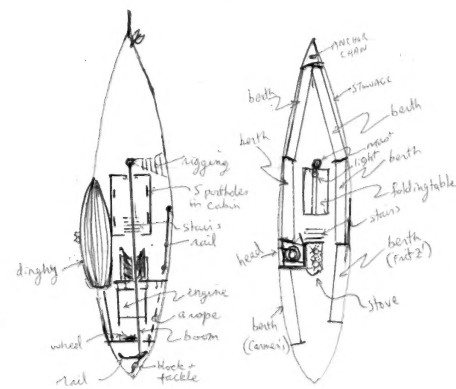
page 7R

some many



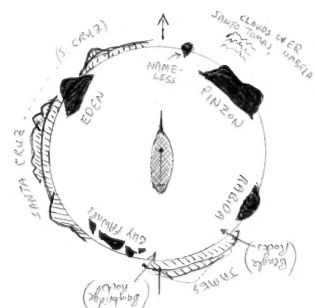
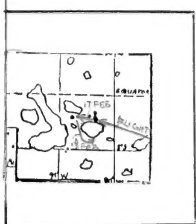
Carmen and Fritz' boat "NIXE" - built by Fritz Angermeyer

(32 feet long, 5 foot draft)



BELOW DECK

(18 FEB 1970)  
HORIZON AT  
7:30 AM.





17 FEB 1970

## EXPENSES

(Paid for by  
Frank Sullivan)

Cab fare, Pension "Holly" → airport 60.00 sucres

Tip for Segundo Rosero, on advice

of Mr. Hobbs, over phone \$10.00 (U.S.)

Beer aboard "Line A" \$2.00 (U.S.)

I changed \$40.00 (U.S.) to 840.00 sucres at airport.

18 FEB 1970

## EXPENSES

(Paid for by  
Rob Smith)

Shirt purchased in Academy Bay 40.00 sucres (= \$2.00)

Rent at Hotel Caba for 4 (night) 240.00 sucres (= 12.00)

280.00 = \$14.00

Bananas (5)

2.00 sucres (= .10)

18 Feb 1970

Page 1012

- Saw two AA - piddler, antbird, 1 shearwater
- acc. to Pats, birds up last spring, but ~ 84
- contents are completely unimpressive
- @ Las Palmeras, mangrove just in view, fairly
- breakers
- 4 kinds of mangroves, one 10' in
- Red - 6' edge, palm Rhizophora
- cutch, w/ small roots
- about 1000 - better mangrove
- interesting
- Scrubby = Lechoso - high up
- Guyes? - large dipter, tall, 2' range
- Land - red
- Locatillo = Mierona - high up on top
- Santa Cruz! (to voice you)

X but this morning approx. Las Palmeras (~ 7:30)  
we got light rain. Carmen pointed out  
area of bright green in coast where rain had  
been - this light, bright (discrete) green cor-  
rately strongly w/ dark brown of coast zone  
elsewhere. Saw her dog over ridge coast. After  
Eden in Puerto Rico in S. Cone. Strongly

coast given its name.  
For further information, Carmen made a family of Frank's  
the dark-brown (green) in brown coast at home  
from surroundings. It takes (to page 11K)  
about a week.



clear sky around 11:30pm  
 as we left Suva's behind  
 New Cumberton barely visible  
 under cloud dead ahead - large & high.  
 Santa Cruz still on left; direction distinct  
 but more like FX Williams than Stewart's  
 description. Flare 3 to right, but  
 isn't visible, only cloud above it. ~ 30 min  
 away.  
 This Am towed small plankton net but  
 got nothing. Missed 1st fine & not  
 big enough @ surface. Should've used hand.

(Landed at Academy Bay ~2 PM).

- Abroad bird, cut hair from front and surrounded  
 by myself & Nasser on Santa Cruz life. Found it  
 got in way when flying. I am getting rather  
 embarrassed, esp. on neck & back of hands. Not  
 enough lotion to go around.
- Fritz told me more about plants of island, &  
 some details of currents, but I forgot most of it.  
 Currents change much, locally depend upon  
 how currents strike island which determine  
 how eddies form between them. Last year was  
 the 21st year, acc. to Fritz.
- Carpenter mentioned Mockingbird of Chamorro  
 (Mimus tutulensis?) - a sp. found only on  
 acc. to Nasser. Chamorro - NOT on Bougainville.  
 Suva has larger Flapjack (to page 12R)  
 rats & dogs may also elude.

18 Feb. 1970  
 page 11R

18 Feb 1970  
 page 12R

- Landed @ Academy Bay ~2 PM  
 - Fritz had a contribution w/ rum @ local store,  
 got no place to stay @ \$6000/night each (\$85.00)  
 meals incl. underwear stuff, nylons, - from unknown  
 steps. Dosed for awhile while Frank played w/  
 rumpus & camera - later left to find grocery  
 supplies almost gone - they will be in tomorrow.  
 Just a few canned goods left. Bought shrimp  
 for \$40.00 (= \$2.00). Walked over to stadium.  
 On way met Mrs. & Mr. Johns  
 2 Peace Corps volunteers. He had cage w/ him.  
 She showed us where to get bananas (bought  
 some - 5 for 1 Suva) and bread, as well  
 as general info. on food, diseases, etc.  
 when they broke, there are 3 bars in Am -  
 one for 50¢, one for 10¢ & one for 10¢.  
 Both? using the right before. Mrs. Johns asked  
 some bystanders "Caribbean" and was asked "i"  
 we parted, left for Parnu Station. Perry not there,  
 was aboard "Rebega" guest of Sierra club, that  
 arrived in afternoon. Carl Engman is aboard the  
 nothing no guide. We waited awhile, then left late  
 & had some water (good!) and returned to hotel,  
 bought more bananas (\$1.50). Had room  
 children here @ hotel w/ soup (condensed or condensed)  
 milk & sugar, fruit salad, & coffee & mineral punch  
 drink (Pepsi?). Saw @ Stadium - Maria Igua.

(to page 13R)







18 Feb 1970  
Page 13 R

Lava lizard all over. Gecko @ nite in room.  
Also geckos, some 1st inst. hatching in egg.  
Cockroach *allipennis* on the wall.  
Antel. *erythraea*, *Alloc. senegalensis*  
abundant. *Schizopoda*  
in hatch.  
Also P2

up, heavy cyphing  
like from  
anal. Smokes betw.  
Culps. Can hook up up  
pm. One one 1 hr. earlier  
& contact in Guaymas  
f' contact indicated he pub

18 Feb 1970  
Page 13 R  
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SATURDAY FEB 14 (Valentine's Day)

11:00 AM  
ALCH 10:00 AM  
CIVIL 10:00 AM  
CIVIL 10:00 AM

GET XEROX FROM FRANK







Mr. Pepper described a custom of indenturing young boys from the mainland to work out here in the Galapagos. The usual arrangement is that the father is paid approx. 125 sucros per year (US\$6.25). The boy works in islands for entire year; he gets <sup>suit of</sup> clothing (one for whole year), 3 meals/day; works 7 days per week, anytime work is requested. Boy gets some time off for swimming + playing, about a couple of hours per day; plus about 1½ hr. of 'studying' (?) - but doesn't go to regular school with other children. (Mr. Pepper calls them 'peons'). Boy is not paid a regular wage; but may earn some tips; also gets money for candy occasionally. [Obviously this is an incentive to produce babies - they yield \$, and needn't be cared for. = slavery.] Custom is widespread in South America, Central America. The boy working here at hotel got up at 6 this morning, prepared fire for the coffee, etc. He seems to be rather happy but that may just be his personality. Nevertheless, these children are better off than those in large cities, where disease, starvation, little clothing, etc.; (e.g., in Guayaquil, young girls (~8-12?) were carrying the slop-garbage by burro-drawn cart at dawn below the Pension 'Helio').

The name of the man on the plane who was a "tour-manager" was Rick Brown, 889 Clayton Street, San Francisco, Cal. 74117 (US) (Mo 4-8367)

4"x9" colour brochure of Galapagos Cruises aboard Lina included:

"Palo Santo" [= Bursera graveolens]. "the most characteristic tree [p.20] of the (lower slopes) of the Galapagos; <sup>the bark</sup> contains a gum whose fragrant scent is detectable from a considerable distance"; [pale white, e.g., South Channel, Baltra]

"Muyuyo" [= Cordia lutea]. small tree w/ fresh green leaves, + showy yellow flowers.

4 spp. of mangrove: (1) red, w/ stilt roots, (2) black mangrove, (3)

Carmen described PALO SANTO as being very green in the rainy season. [re: p.21]

white mangrove, or "Jeli", characterized by its thick, twisted, ribbed trunk, and (4) button mangrove, or "Land Jeli", less common, bears cone-like fruit.

"Lechoso" = local name for Scaligeria

Cruise prices range from \$215-700 (single) or 175-480 (2-berth) or to 350 (3).

Write to "Adventure Associates" 301 Outdoors Bldg, Columbia, Mo.

on "Galapagos Guides" Box 2542, Quito, Ecuador

Telephone from anywhere in U.S. - (no charge) to Adv. Assoc. (800) 325-2591

Info for book from C.D.R.S., Santa Cruz, Galapagos.

20 Feb 1970

(Aboard "Nise" with Carmen + Fritz Angermeyer), additional passengers:  
Bob Medden<sup>(beachgoer)</sup> (National Geographic) + 2 girls, one an osteology EMU microscopist from California. Carmen fixed breakfast: cheese + bread, + coffee. She told us that several beaches towards the interior of ~~the~~<sup>Anderson</sup> Bay had been removed for concrete + cement construction for roads, hospitals. At one time they were used for swimming beaches for children; were very pretty. Now also a small beach near where the Angermeyers live is being slowly eroded away by removal of sand for construction. Some cooperation from local officials to stop it but people sneak in at night + remove tons of material; little by little the beach is lowered. Reaction of locals is "Oh, the Angermeyers want a beach to themselves." Little realization of long term process - the sand is there, worth \$ to people if they can't it away; leaving the sand alone gives them nothing. An understandable situation.

This morning Carmen lowered a bucket over the side and the water had the densest concentration of plankton I've ever seen. A dipped teaspoon  $\rightarrow$  4 or 5 organisms. Some things looked like

Volvox, there were some hydroids, many copepods, etc. Also a blue (Bill) unit ostracod (Macrogon pictured); also passed schools of mullet that ripple the water, like a rip tide; also passed a dozen 3'-5'-10'-20' Manta rays. (Px). Fritz told me they feed on surface plankton, concentrate where currents come together;



Arrived Belton ~ 11<sup>00</sup> AM - We were told that the plane wouldn't be in until about 1<sup>00</sup> PM; around 1<sup>00</sup> we were told 2<sup>30</sup>-3<sup>00</sup> PM. We waited, exchanged some passengers with Lina A. Went over to Lina A for a hr. Later 1<sup>15</sup> & 2<sup>30</sup> PM. - they served us (Phil, Gwen, & I) spiced shrimp, (passengers recognized me from plane on Tuesday) meat on toast, potato salad, beer, icky water. Spoke to Rick Brown at bar (re: p. 2)

[On way back, in South Channel, saw many Palo Santo (re: p. 21); interspersed with "Rruon-pa Olio" (or something like that) - the name means "break pots" in Spanish (re: Carmen A.) - (may refer to hot-burning hardwood (?)) - a bright green bush. Carmen thinks Palo Santo = Bursaria (✓), has 5-compound leaflets.]

On board Line A, all passengers waited in bin/lobby area since crew was making up stations for new passengers to be received at Biltza. About 2<sup>30</sup> we returned to "Mixe"; Fritz + I went to dock; bus + truck(s) left for 2<sup>th</sup> time for passengers and baggage. The skinning man from Metropolitan Touring arrived and demanded \$40<sup>00</sup> for the 300<sup>lb</sup> of baggage, which I paid in \$US<sub>A</sub> (no receipt) after getting stuff. All cameras (!) + film here, incl. Frank's + Rob's cameras + Robin's suitcase. Ice chests must have saved the film. All stuff was in shade, locked at airport (NOT consulate).

Plans are in the works for a road to go down to Ballina from Bella Vista!  
Not only that, but a US Army general (Southern Cross?) was arriving to look over the

plans - the US Army would supply equipment. Attitude of Carmen + Fitz not reassuring - they seem to think a "small" hotel, some water skiing etc. @ Bultra would be OK - not adverse to "development".

I should a good map of the world for Mr. Lucio Salto, who made <sup>radio-</sup>telephone call to the Consul at his home. I should get a copy of Slevin's "Log of the Academy" for Fitz + Carmen, also for them something for the boat (e.g., polyethylene <sup>[squeeze bottles]</sup> containers?). Station doesn't subscribe to science, I should get something like that for Station, also a copy of (McA + W.S.) "Island biogeography".

19 Feb 1970

Breakfast of coffee, rolls, groundy eggs; then walked to Station. Talked with Mr. Perry when he finished with tourists. He wants vita-sheet of roots + what-we-are-doing from each of us. He was rather pleasant and would accommodate us as much as possible despite our lack of warning or letters (s) <sup>(mentioned equipment to him, Nikon scope, etc.)</sup> (incl. Boller, song) of introduction. We arranged to have lunch at the station; (it was served w/ beer - some sort of meat dish on rice w/ a vinegary-cucumber-like-dish, cut from outside of some kind of vegetable.) spent afternoon examining botanical material at the station; kept out of sun to avoid sunburn. I examined station's labelled garden; learned Parkinsonia, a few plants also learned from Dr. Heber, who has been here 4 years doing botanical work (herbarium). From him I learned Sectia spectata (ouch). Also saw my first Xylocopa darwini; caught ~~at~~ by hand in front of lab building <sup>hovering</sup> over low bushes of Alternanthera ~~echinocarpa~~ <sup>echinocarpa</sup> - (guarding territory). Bee was examined - eyes show speckled interference patterns that remain "in place", (w pseudopupil) as one rotates eye - would interest Bernard of Miller. A ♀ seen visiting Salicaria - tame!?! I knocked it with finger - no reaction. Should be easy to mark. The ♂

had a small yellowish-brown thing crawling about on head, between antennae - (= Cissites larva, probably) no nests seen or looked for. The ♂ marked w/ India ink in cell of right forewing, also on thorax on upper left. [Re-marked no #1 - was there each day looked for through the 22nd, which is day this is being written.] Released ♂ disappeared upon release but may ~~(not)~~ return.

20 Feb 1970

Shiny man from Metropolitan Touring wouldn't make any sort of deal on cost of luggage-transport vs cost of extra day's charter. Now Lina-A owners really owe us 2 day's extra charter - (1) not allowed to bring stuff since their passengers nonpoliced Theo (18 Feb) flight, so 20 Feb owed; (2) took wrong baggage the 18<sup>th</sup>, so another day owed. Metropolitan Touring, charter plane from Government (Tame), acts as tour agent - no connection with Lina A. (?!?!). Must write to Lina A! (back owners)

Return aboard "Nixe" incl. myself; Fitz + Carmen; <sup>(know-it-all)</sup> Bob Madden (WS photographer) 2 girls (Pam <sup>[EAT]</sup> + Maxine); a <sup>chubby</sup> man + his son (he is Salmon fisherman <sup>(uno boat)</sup> from Seattle, off season; the guy (orb ?) who teaches elementary biology to elementary minds aboard "Lina A" (sells sundan lotion + postcards aboard, too). Bob <sup>Madden</sup> gave me \$25 to cover himself + 2 girls - this I gave to Fitz. ~~the~~ No arrangement made between myself + others aboard, except that, in each case, Fitz agreed to take them - only after consulting me for veto first. While loading my glasses dropped off pier - a few minutes later Carmen dove for it - got them on first dive. (Fitz can't dive - he has punctured eardrum) Carmen is really great! Aboard lunch was her great bread, tangfish w/ tomato paste, cheeses, etc. I split a



beer with Fritz. I'm very happy about everything being there.

In south channel, shot (pk) of sea lion, <sup>portrait of Fritz, sunset over</sup> northern end of Santa Cruz. - w/ 400 mm on 1000 DTL, hissed Ekta.

Fritz just described some properties of woods here.

Scalera is used as a lumber & is good provided one removes the pith; grows straight\* and tall. A wood, described as "the best wood in the world;" heavier than water, similar to teak, of which the keel & bottom of the boat is made (he built whole boat himself) - is called "MATA SANO".

Fritz also mentioned that after the collapse of Fernandina he saw lightning larger than any he had seen before in his life, [If ordinary lightning = thickness of finger, this = 2x girth of man (area indicated)] intermittent for ~2 hrs. after collapse.

"Night lightning" is occasionally seen at a distance (no rain). Lightning more prevalent during thunderstorms, in rainy season. He has seen at least 1 waterspout, so that possibility as well.

2 ~~at~~ night feeding gulls passed us over port side - quite dark, full moon approx 30° high over port. (look like bats)

Never get severe storms (except heavy rains) - sometimes high winds, esp. near points of islands. (Fritz)

Fritz' boat has indicated times between islands →

Night feeding gulls common on Plaga, Daphne, & a few other places



Carmen told me earlier that sometimes Xylocopa are attracted to artificial flowers made into straw hats worn around here. [She felt that they didn't use smell but, more likely, vision. Remarkable observation !!!]

Fritz mentioned something about rafting yesterday. He very rarely sees anything at sea like natural rafts, just man-made driftwood. However, in the rainy season, he occasionally sees branches sticking out of water, and he's sort of promised to help if possible examine any such material we encounter.

21 Feb 1970

Details of day below (p. 27).

Blacklight set up facing west from lab building, using wall as reflector. New records for Galapagos = Procoptera, ~~see~~ abundant at UVBL; also Rhipiphoridae (several specimens) & a Psocoptera; many Oedemeridae, an Elaterid, some short-antenned Cucujid-looking (Ostomatid?) beetles that stridulate; mosquitoes abundant. Also Cerambycidae, esp. one that closely resembles mangrove species from Florida; also Colletidae ants and termites; also a Reduviid-looking bug, prob. Emesina, that "pumps" up & down on legs at night, resembling a lizard doing "pushups". Also Hydrophilidae (1 species?). Some stuff in alcohol (no other subsequent night). Lepidoptera abundant, in rather poor shape, ~~and~~ due to lack of quick killing jar.

Recorded details of <sup>day on</sup> walk home at night - moonlit, etc.

Got up, had breakfast this morning - crummy eggs --- breakfast getting worse at "Hotel Colon Isabela" where we stay with Mr. Pappan. Walked over to Charles Darwin Research Station - I talked to Mr. Perry, who had Miguel (has worked for station 6 years, since dedication) (Miguel is from mainland Ecuador) take me over to Fritz' boat to pick up luggage. I forgot travelless' checks so I'll have to pay Fritz later. Trip back <sup>at</sup> low tide is tricky detour around rocks. (Fritz's boat has 5' draft, can't get near station.) We (Miguel & I)

unloaded stuff at the pier; Rob Smith then helped us load + unload jeep at the lab, while Franke fiddled with his camera. Stowed stuff under sinks + window-tables. Spent rest of day working on paint set, setting up. Darkroom is elsewhere on station grounds — not at lab. — this may mean difficulties in timing of developing + photographing later. I don't want to have to develop in blackish water — which is the only stuff running in the lab. Fresh water is outside in a tank near the lab. — must go out in hot sun to get water to drink.

Dinner at station (lunch) — meat with rice (jiblet), whole potatoes, guacamole (avocado), lemonade. 2 guys from Florida (work at Ross Allen's; from northern part of state) are here filming, but are not doing anything for any single particular market; they are having trouble deciding what markets will be best, but they feel they have good films.

Mr. Perry seems to be an effective station director — discouraging + keeping out non-scientists/non-workers.

On way to station, there's a overhanging machined tree (*Hippomane mancinella*) labelled " — injurious to health." Leaves pointed at tip, ovoid; [bark similar to trees we couldn't distinguish in Fla. (incl. blackwood, poinsettia, ...)]. Tree covered with cordate leaves of something else (*Cyrtocarpus*?), so hard to tell what's what. *Hippomane* appeared to have apical staminate (flowers) — inflorescences. I leaned against it (no effect).

Mr. Perry showed considerable interest in the blacklight I set up. Apparently he's never seen one; of course, being a collector of

moths, he was rather amazed at the results. Neither had Dr. J. de Vries (bearded <sup>holding</sup> Dutchman who is working at the station) field is bird-of-prey ecology; has interests in Lycorids (e.g. *Vrijm*, L. 2. A.M. Kessler-Geschichte. 1967. The phenology + habitat of *Parloria monticola*, *P. nigricans*, and *P. pulchra* (Araneae, Lycoridae). J. Anim. Ecol. 36: 31-56] — has a few Lycorid pets here at station; also interested in Lepidoptera) ever seen one. Perry + de Vries have several dozen additions to Galapagos 'heterocera' — mostly Noctuids + Pyralids. They've sent stuff to British Museum (one shipment lost) for determination.

At dinner we discussed itinerary for Fernandina + other places — trips + expenses. We <sup>(I)</sup> want to make March 3-5 trip to Fernandina with Perry — he's been down before (Dec., 1968) and knows the way. Another possibility is that the Calypso may help us with their 2-man helicopter (!) — drop in water + supplies.

Perry + debris 'casually' picked moths off light + walls — I don't think they want to show their surprise at the improvement.

Tonight I noticed that Lycorids seem to be <sup>missing</sup> ~~along~~ along ground-trails — replaced by *Heteropoda*! on trail, ground, in vegetation, etc. — not just on walls + under bark. (I did notice a Lycorid on Balboa behind airport under stone.) (de Vries' Lycorids were collected at cave(s), blackish (?) not right at station) (*Heteropoda* - eyes glow just like Lycorids) Also collected a vial of spiders at dock tonight.

*Gasteracanthus* is a different species ~~here~~ here with a charac.



22 Feb 1970  
 on #8 down in  
 territory in front  
 of CDR's lab (ldg)  
 (Alaska - Santa Cruz)  
 Academy Bay  
 plant is *Allocastrum*  
*acanthosiphon*



very - enormous from  
park in seconds - to N.S. pin  
from left gone - 35 on left

#3 - (23) Feb 70 trail (B) (♀) (♀)

#4 - " (♀) (♀)

#5 - " (♀) (♀)

#6 - " ♀ (W)

#7 - " ♀ (R)

#8 - " ♀ (B)

#9 - " ♀ (A)

#10 - " ♀ (W) (A)

#11 - " ♀ (W) (A)

#12 - " ♀ (W) (A)

#13 - " ♀ (W) (A)

#14 - " ♀ (W) (A)

#15 - " ♀ (W) (A)

#16 - " ♀ (W) (A)

#17 - " ♀ (W) (A)

#18 - " ♀ (W) (A)

#19 - " ♀ (W) (A)

#20 - " ♀ (W) (A)

#21 - " ♀ (W) (A)

#22 - " ♀ (W) (A)

#23 - " ♀ (W) (A)

#24 - " ♀ (W) (A)

#25 - " ♀ (W) (A)

#26 - " ♀ (W) (A)

#27 - " ♀ (W) (A)

#28 - " ♀ (W) (A)

#29 - " ♀ (W) (A)

#30 - " ♀ (W) (A)

23/ blue eyed aged but  
weathered in lower bottom  
left side of mounds - having white  
West Indian 100m brk 127 m

settled here ~ 40 yrs ago (1926)

w/ sp. of 45 men from Norway

only 2 left now. Brought common

to them - didn't know what.

Lived here since settled, began

work w/ start of station ~ 1957.

Care of tortoise. Never stay by

bees + but knows they can bite.

Knows centipedes not doing good

pen. C's were more abundant,

roos in lowlands, now he believes

fire ants eat eggs - more

abundant above. C's enter houses.

DEVELOPED PR film

(Quana) (save for over

29, 25

2/11



日 12



4 13

[illegible]

Thymus <sup>and</sup> <sup>or</sup> <sup>rose</sup>  
 Rose <sup>is</sup> <sup>the</sup> <sup>same</sup>  
 same <sup>as</sup> <sup>the</sup> <sup>rose</sup>  
 same <sup>as</sup> <sup>the</sup> <sup>rose</sup>  
 same <sup>as</sup> <sup>the</sup> <sup>rose</sup>  
 same <sup>as</sup> <sup>the</sup> <sup>rose</sup>

the <sup>same</sup> <sup>as</sup> <sup>the</sup> <sup>rose</sup>  
 same <sup>as</sup> <sup>the</sup> <sup>rose</sup>  
 same <sup>as</sup> <sup>the</sup> <sup>rose</sup>

Lycium <sup>or</sup> <sup>white</sup> <sup>yellow</sup> <sup>fl.</sup> <sup>Lycium</sup>

Ed <sup>or</sup> <sup>Lycium</sup> <sup>White</sup> <sup>Yellow</sup> <sup>fl.</sup> <sup>Lycium</sup>

the <sup>same</sup> <sup>as</sup> <sup>the</sup> <sup>rose</sup>  
 same <sup>as</sup> <sup>the</sup> <sup>rose</sup>  
 same <sup>as</sup> <sup>the</sup> <sup>rose</sup>

DR. VILL. *[faint handwritten text]*

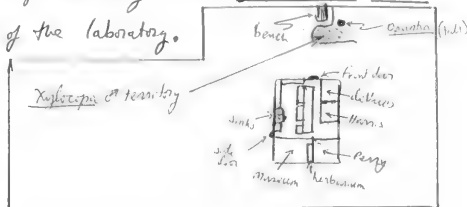




25 Feb. 1970

Marked bees in front of laboratory building while taping recording "letter" to all, sitting in front of lab on benches. Very hot. ♂ #1 has not returned to his territory. Another ♂ caught occupying it, labelled. (⊙⊙) Another ♂ replaced that one, labelled (⊙⊙). A third ♂ replaced the second, labelled (⊙⊙). I have not seen ♂ or any where but in that style territory above Altman's echinocephala, in front of the laboratory.

2 ♀♀, visiting the Scalea in front of the station, were also marked. (⊙⊙, ⊙⊙). Both of these hovered in front of me for about 10-15 seconds before taking leave after release.



This evening, about 11 PM, Dr. de Vries and I talked over the use of my blacklight, which he will use at station during my trip to the Caseta, and at Tower Island next week with his portable generator. He will have a plywood box constructed for it. I gave him some rubber foam to pack it. (See my letter to him, left on his door, copy, p. 43)

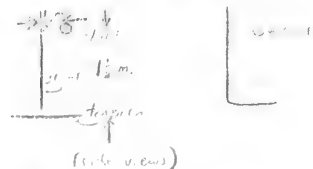
Dr. Perry and I had a discussion about Fernandina trip. His party presently includes himself, Sir Eric Shipton (in his 60's, Himalayan mountaineer, to 20,000' feet on Everest, searched for abominable snowman, etc.), Dr. Saïd, Dr. and Mrs. Harris, plus ? - porter???. Dr. Perry cannot tell me details of whether or not I may accompany them until Saturday, — which means, of course, Monday. [to page 44]

25 FEB. 1970

[COPY OF LETTER TO DR. DEVRIES]  
11:30 PM.  
25 Feb 1970

Dear Dr. DeVries,

I forgot to mention to you that I might like the best way to use the blacklight in to reflect it off a fairly standard sheet hung vertically, with a trap I have it as with the actual sheet held for and below the light.



Also, the lamp should be taken out of the sun in the morning — at night it will be hot. I would really appreciate your sending the book to me by 2 pounds, and maybe 11 will not be too heavy for me to carry for days, and at too expensive to send further notes. I have a pleasant and successful trip to Tower.

Sincerely,

Robert Silberglied

25 Feb. 1970 (AM)  
at Jimmy Perez'

[Supplies for 6 persons] (3 days)	
18 little boxes of raisins	3 6.00 ✓
12 cans of tuna fish	6 9.60 ✓
6 chocolate bars (bars)	6 6.00 ✓
2 jars of jam	3 2.00 ✓
2 jars of peanut butter	2 6.00 ✓
3 boxes of Jello	1 2.00 ✓
6 envelopes of dried soup	6 6.00 ✓
20 boxes of tea	2 0.00 ✓

(\$6.35 [US] = 3 2 7.60 \* (SUCCES)  
Paid for by J.D. MacMath  
(each share approx \$4.60 US)

(Dr. Peter Pritchard gave Rob. Smith 200.00 sucres for his share of above, should get rebate.)

25 Feb. 1970 (AM)  
at Jimmy Perez'

2 giant chocolate bars	2 2.00
2 Phys. sugar	3 0.00
Large box of raisins	1 6.00
Notebook	6.00

(\$2.35 [US] = 4 7.00 \* (SUCCES)  
paid in sucres by myself

since I will be at Caseta the next few days. (We presently plan to leave at 5 a.m. tomorrow.)

Dr. Perry suggests that to transfer money to the station's account, I write to source to "arrange a ~~transfer~~ transfer for the sum of \$ — to the account of the Charles Darwin Research Station, Bank of London and Montreal, Casilla 1335, Guayaquil, Ecuador". I must also arrange to be notified with a copy of the transfer, or by a cable (to Robert Silberglied, Darwin Station, Santa Cruz, Galapagos, Ecuador) to me stating that the transfer has been effected.

## LOCALITY INDEX (PRINTED ATOP VIAL CORKS)

DS	Darwin Station, Academy Bay, <u>SANTA CRUZ</u>
X	Miscellaneous locality
SP	<u>South Plaza</u>
CA	Caseta, in tortoise reserve, s.w. <u>Santa Cruz</u>
T-D	<u>TOWER</u> (=Gousson), collected by Mr. T. de Vries (5-7 Mar. 1970)
FE	<u>Fernandina</u> , N. S. de, to 43 mi in, near 3 small cones (25-27 Mar 1970)
O	Empty vial
TC	Tagus Cove, <u>ISABELA</u>
AL	Alcald, <u>ISABELA</u>
PE	Punta Esphosa, <u>FERNANDINA</u> (24 Mar 1970)
FE	<del>Fernandina</del> , north slope
JB	James Bay, <u>SANTIAGO</u>
PA	Punta Albemarle, <u>ISABELA</u>
JE	<u>JERVIS</u>
DU	<u>DUNCAN</u>
SC	'Sombrero Chino', Barrabridge Rocks, nr. <u>SANTIAGO</u>
BA	<u>Barrington</u>
PP	Punta Pitt, <u>SAN CRISTOBAL</u>
TR	Tenapi Road, <u>SAN CRISTOBAL</u>
WB	Wreck Bay, <u>SAN CRISTOBAL</u>
EC	El Chino, <u>SAN CRISTOBAL</u>
EJ	El Junco, <u>SAN CRISTOBAL</u>
GH	<u>GARDNER NEAR HOOP</u>
PS	Punta Suarez, <u>ESPAÑOLA</u>

HO HOOD; ANCHORAGE E. of Peninsula

GC GARDNER NEAR CHARLES

LC LAS CUEVAS, FLOREANA

CH CHAMPAON

PO Postoffice Bay, FLOREANA

BB 3 m. E. of BLACK BEACH, FLOREANA (800 ft.)





7.

1) *Abies*  
*concolor*

2) *Abies*  
*milleri*

7.

52

7.

53

54

17

55

28

56

28

57

29

5/1

5/1



60

71

61

1



COPY

BFA 2 FEB 1970

MR ROGER PERRY

CHIEF DIRECTOR RESEARCH STATION

SANTA CRUZ - GALÁPAGOS IS. - ECUADOR

DEAR MR PERRY:

I DO NOT KNOW OF ANY DECISION YOU MAY HAVE REACHED REGARDING THE POSSIBILITY WE DISCUSSED OF MY ACCOMPANYING YOU AND YOUR PARTY ON THE FERNANDINA ASCENT AND DESCENT WITHIN AFTER SPENDING SOME TIME GETTING 'ACCLIMATED' TO EASY GALÁPAGOS TERRAIN (i.e. TO THE CASHA AND LACK). I CAN TELL YOU NOW THAT I AM DEFINITELY NOT IN SHAPE FOR SUCH A RUGGED CLIMB AS FERNANDINA. I HOPE THIS EASES YOUR JOB OF INFORMING ME OF YOUR DECISION. IN ANY EVENT, IT IS A BIT TOO LATE FOR ME TO BUY SUPPLIES, GET PREPARED, ETC., AND SO I WISH YOU THE BEST OF SUCCESS IN YOUR JOURNEY. PERHAPS I SHALL BE ABLE TO ACCOMPANY A LATER PARTY, AS YOU SUGGESTED MIGHT BE THE CASE.

IF YOU DO DESCEND INTO THE CALDERA, ANY TRAIL MARKINGS OR INFORMATION YOU RETURN WITH AS TO THE ROUTE TAKEN

WOULD BE GREATLY APPRECIATED AND WOULD PROVE MOST USEFUL TO LATER GROUPS. MY OWN INTENDED TRIP AVOIDED.

THANK YOU FOR YOUR CONSIDERATION AND GOOD LUCK

Sincerely,

*Robert Silverman*  
ROBERT SILVERMAN



68

2

69

2





72

3

73

2



76

1

77

4



Took a test roll of Pan X, with pictures of Xylocopa darwini  
 on Scalesia, also Dione vanillae, ♂ X. darwini hovering, [attempt]  
Tropidurus. All series start at f/4, go down 1 stop  
 at a time. 

mamiya	2x	1015	135
--------	----	------	-----

 Gunstock mounted, ringflash,  $\frac{1}{60}$  sec.,  
 all in bright sunlight, except lizard.

RESULTS: correct ~ f/5.6 all with GHOST IMAGES (in light!) except lizard.



5 March 1970  
(Friday)

Pepper and then Karl Angermeyer woke us about 4 AM, which was late since we should have been at the dock at 4. Carried the equipment to the dock (about 50 lb) and in 3 shifts loaded into the <sup>mine</sup>sonia via skiff. Stowed stuff below (small was bad); boat filthy, Garcia (who anno't is a skinny old man, grey hair, wiry w/deepten. (Speaks spanish only). Ate some overripe bananas. Air was cool.

The ocean was beautifully "phosphorescent" and greenish white along the edge of the boat; water was also white. Individual ~~sparkles~~ could be seen at the edges of rapidly moving foam ~~near boat~~. Fish moving through the water, away from the boat, left white trails.

Both Academy Bay and Commaño have flashing lights. Darwin station is the only continuously lit place in the harbor. Just on the horizon was the near-new moon, a visible crescent that seemed to continue all the way around circle ~~horizon~~. During the morning we passed Cerro Nuñez at coast and Garaputo (?), Cerro Haca + los tres sigües were also distinct; (confirmed by Karl A.). Arrived about mid-morning at S. Playa channel; disembarked by dinghy.

Said goodby to Sid MacMath (address: ) and

[seen to keguelen; interested in vert. life of distant oceanic islands] <sup>had discussion last night on Pigeon</sup> <sup>at Hotel Colon</sup>

During the day we had visits by crewmen of the Calypso, who were filming at S. Playa + off Gordon Rocks all the time during our stay. On Saturday they brought us, as a gift, flippers, snorkel + mask! Also visiting were the tourists of the Line A, with the bland guy (who was like a 'counselor') and Karl Angermeyer, acting as a guide. The tourists disbanded from several boatloads, some individuals lagging behind + going off on their own. They fed bread and bananas

6 March 1970

to the tower iguanas (land) and photographed everything - sea lions, birds, iguanas, calypso-crew, and us. Some trash left; a few lone wandering tourists went off from groups. Tourists landed about 3 PM + left about 5. I photographed tourists, Calypso people.

When we disembarked onto S. Playa the rocks were slippery. A big ♂ + several other sea lions had to be chased off the pier.

We had 24 catarulas + 5 gallons of water. We set up camp <sup>west</sup> of the pier (several hundred feet), among some Opuntia and Parkinsonia. Others used tube-tents for shade; I put up Pancha.

(400 mm lens + 2-L tubes)

During the day I photographed a ~~few~~ Schistocerca, but none collected.

Also got motion-pictures of crabs (red) and warblers feeding at dead porcupine-fish that had floated ashore (warbler feeding on flies?).

Also fork-tailed gulls, and nest with <sup>single mottled</sup> egg, young; they give a chickening call (click in alarm call, too). Saw some other Acrididae.

Dry zone insects are found under Opuntia - pads during day; include silverfish, scorpions, weevils, tenebrionids (dusky and hard to see). Exposing them to sunlight activate them. Tenebrionids include several forms - smooth, striated, and little (on camera) - Finches (ractus finch?) seen and photographed on ground succulent <sup>5-petalled [prob Sesuvium sp.? - D. Weber]</sup> with small pink flowers. (Saw thing X.d. visits at station). 2 Xyloropa ♀♀ seen but none collected. One or 2 species of Camponotus on the island; several colonies w/ alate ♂ + ♀ collected.

At night, few insects came to fire, one moth in soup (not collected).

Beetles were active everywhere. (Later collected 3 species; one smooth tenebrionid which runs quickly and


(\*ALDOREAE)

6 March 1970

death figs, also a rugose tenebrionid that walks slowly (uncommon) and a smaller, flatter one (rarely seen).

Weevils (*Gastrophysa*?) collected on ground and on *Opuntia* at night; these stridulate. *Camponotus* (black) found on *Opuntias* wherever weevils were. One date termite (not collected) came to headlamp. No spiders could be found by "headlighting", despite 5 minute search.

[A further search, ~5 min the next day, also → nothing.]

Some spiders spinning webs (night-webs) collected; some with orb and retreat (!?),  (retreat)

on *Opuntia* and also on *Parkinsonia*.

Later at night tried to photograph weevils & tenebrionids, but flash wouldn't work. It wouldn't flash despite indicator light showing, on both regular & ringlight.

Tomato soup & turnipish for dinner, tea.

Labelled insects, wrote notes, and went to sleep.

FLORES

C.O.R.S.  
5 Aug 70

EH (1)

PARKINSONIA  
ACACIA RORUDIANA

K (1)

SCALESIA &amp; PARKINSONIA

ALTERNANTHERA NUDICAULIS  
ALTERNANTHERA ECHINOCEPHALA  
LAVA LIZARD  
SCUTIA SPICATA

TOURNOUFORTIA PUBESCENS

LICHEN

LICHEN

TOURNOUFORTIA PSILOSTACHYA

LAVA LIZARD

SCALESIA

SCALESIA &amp; PARKINSONIA

SCUTIA

TOURNOUFORTIA PUBESCENS

ALTERNANTHERA NUDICAULIS

LAVA LIZARD

ALTERNANTHERA ECHINOCEPHALA

MAYTENUS

CRYPTOCARPUS

K (1)

WALTHERIA

WALTHERIA

CROTON

RHYNCOSSIA

RHYNCOSSIA

GALACTEA

RHYNCOSSIA

CORDIA GALABAGEIA

CORDIA GALAPAGEIA

PASSIFLORA

CORDIA LUTEA

CROTON

ACACIA

TOURNOUFORTIA PUBESCENS

TOURNOUFORTIA PUBESCENS

TOURNOUFORTIA PSILOSTACHYA

IPOMOEA

SESUVIUM

IPOMOEA

HIPPOMANE

XYLOCOCA IN HIBISCUS

HIBISCUS

6 March 1970

death figs, also a rugose tenebrionid that walks slowly (uncommon) and a smaller, flatter one (rarely seen). Weevils (*Gerstaeckeria*?) collected on ground and on *Opuntia* at night; these stridulate. *Camponotus* (black) found on *Opuntias* wherever weevils were. One date termite (not collected) came to headlamp. No spiders could be found by "headlighting", despite 5 minute search.

CORS

A &amp; G


K/1 PORTULACA  
 2 ACACIA TORTOOSA  
 2 PROSOPIS  
 2 MAYTENUS  
 CORDIA LUTEA  
 CASTELA  
 ALT. ECHINOCEPH.  
 CORDIA LUTEA  
 PISCIDIA  
 BOERHAAVIA  
 2 PISCIDIA  
 LICHENS ON PISCIDIA  
 CHIOCOCCA  
 2 FLIES  
 CASTELA

K/3 VALLESIA  
 CASTELA  
 CRYPTOCARPUS  
 2 LAVA LIZ.  
 ????? URTICACEAE ??  
 2 MOMORDICA  
 ZANTHOXYLEM 'DRY'

B

7 MARCH 1970  
(Saturday)

I awoke several times during the night; it was cool and I put on jacket; it was more comfortable than at the cañon, though. The sea lions made noises all night - barks, grunts, snorts, coughs, wheezes, etc. A slight condensation had collected on things, but not on photographic equipment. Robin Eckhardt had built fire; we had jam on bread, crackers, tea, raisins, chocolate. A Spanish <sup>speaking</sup> fisherman came by; he called us 'amigos' and asked for "juice" (sugar), not "sweets" (\$) in a confused conversation with Frank. In return he said he'd bring "langostos" (= lobsters) if they caught any. [He never reappeared!] (Frank says Karl A. said that there were lobsters abundant on the eastern point.) Finches of several species were abundant at breakfast, esp. fuliginosa, fortis, and scandens. (One scandens had yellow stuff (pollen?) on bill.) I collected Monocnemum(?) - like ant around jam.

Around noon while breaking into an Opuntia trunk a Calypso cameraman came by and mentioned the eclipse. I had completely forgotten about it, and it was right then. I photographed it on end of Kodachrome X roll(?), also finished a roll of deco-infrared with #12 yellow filter; also super-8 with Bolex with #88(?) filter. Eclipse went to about , but no loss in light intensity was noticed; it did, however, seem cooler about noon. Burned up 12 film! I photographed herons, gulls with egg, attempted to get "surfing" seals, cacti, land iguanas, and ourselves swimming with sea lions, after lunch. (Latter with locking cable release) We took time to find area not in bull's territory?

7 MARCH 1970

The Calypso went to and from Gordon Rocks; spent nights in channel opposite N. Plaza. I would like to get to N. Plaza but no chance, yet. ~~forgot~~

Calypso people spent time filming "effects of eclipse" on animals (iguanas, sea lions).

Today I got close enough to a great-blue heron around sunset to almost run out of focusing range on my 135 mm lens! 2 swallowtail gulls kept attacking him and everytime one came close he'd raise his crest; finally my motions caused him to fly, at which time several gulls pursued him closely with loud cries.

I lost my thumb attachment for the short 'Ultima' cable release, in vicinity of camp bed at night; also lost attachment part of cable release of gonostock, at the western point near seagull nest.

Chicken soup + tunafish for dinner; tea

Eggshell of land iguana (?) found on surface of ground at top of cliff.



7 MARCH 1970 | This afternoon I also collected some beetles + larvae under a very old, dry ~~scenton~~ <sup>scenton</sup> carcass. I also got some termites under stones that had been shielded by dead Opuntia trunks; also head capsules of large termites within branches (dead) of still-borne Parkinsonia.

The black Camponotus search Opuntia-pads at night, and are found wherever the weevils are. I don't know what the ants feed on there. Also, they are on the ground with the beetles, especially the smooth ground tenebrionid.

On the highest point of the island I heard high-pitch humming very loud. 2 ♂♂ X. darwini were fighting for THAT spot! I captured one. [Red color of specimen may be due to >24 hours in cyanide]

I still owe Sid MacMuth a share for supplies for Cassia trip! (He invites me in anytime I'm in Arkansas.)

This evening Flash wouldn't work again; just a few flashes, as though batteries were low. I may have shorted out the batteries!

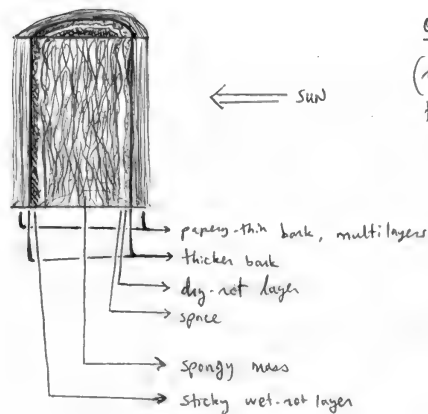
In the evening I looked at clear sky with  $2 \times 400 = 800$  mm lens.

o.g., the Pleiades. <sup>(filled field)</sup> →

A cloud went in front of stars;

(I saw in this group ~50 more)

7 MARCH 1970



Opuntia l.s.  
(not of standing dead trunk)

I worked on Opuntia (above) - a dead standing trunk. The 2 sides are different, depending upon whether or not dry- or wet rot. WET ROT has live Stratiomyid larvae, and roaches. A live teneral adult stratiomyid fly collected. [No note of biology in M.T. James' 1966 Proc. Cal. Acad. Sci. 33 (12):535-542 [1966] paper]

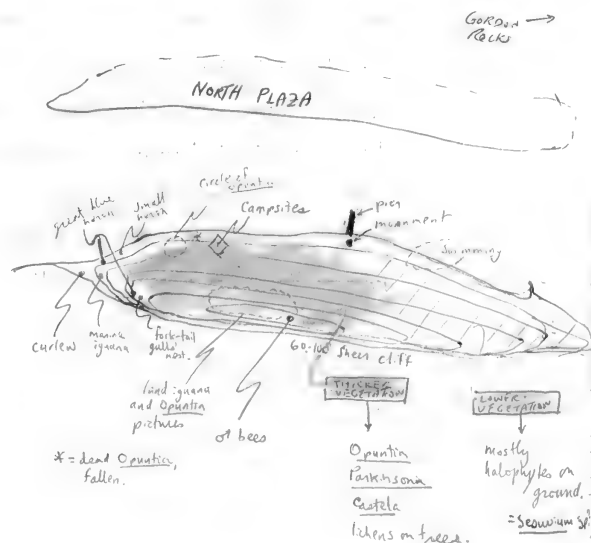
DRY ROT layers and THIN-bark layers have silverfish (eggs?) in perforated bark layer, beetle larvae, scorpions; a SOLENOID(?) collected in perforated bark area, too. Also dependent on Opuntia are Gerrhonotus (weevils), Camponotus, finches, iguanas, Tropidurus (for insects); also turtles in some places.

I collected some LIVE Stratiomyid larvae, too.

8 MARCH 1970

This morning woke up and it was entirely overcast, but it had cleared by 8 AM. Condensation presents Jam on bread, and tea w/ raisins for breakfast. Boat ("sonia") arrived early, before 8<sup>30</sup> AM. We rushed to pack. I never got a chance to collect plants. I got a rather poor sample of cactus-and litter for beehive funnels, in a plastic bag left behind by the Calypso photographers. My pack was 50-55 lb and I could hardly carry or walk with it; it nearly fell off as I got into and out of boat. The little dinghy of the Sonia

SANTA CRUZ

CHRYSEIS  
ANCHORED

8 MARCH 1970

was loaded too full and the waterline was 2" below the gunwales on one side! The water was calm and clear though, & we made it, although Frank & I nearly fell in boarding the Sonia. The water was so clear you could see patterns on fish clearly 8 feet down!

### Expenses of <sup>Plaza</sup> ~~trip~~ trip, other expenses

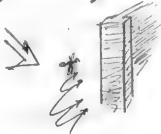
Beer for me	ROBIN	.	(8 Mar)
Beer for me	ROB	5.00	(5 Mar)
Hotel (my share)	FRANK	1,785.00	(5 Mar)
Containers for water	FRANK	50.00	(5 Mar)
Cocacolas (24)	FRANK	48.00	(5 Mar)
to Garcia *	ROB	300.00	(6-8 Mar)
to Garcia *	ROBIN	500.00	(6-8 Mar)
to Garcia *	FRANK	100.00	(6-8 Mar)
Food	FRANK	99.00	(5 MAR)
Food	ROBIN	10.00	(5 MAR)
Food	ROB	20.00	(5 MAR)
Food	ROBIN	12.00	(5 MAR)
Laundry (mine)	FRANK	8.00	(9 MAR)
Laundry (mine)	ROB	20.00	(9 MAR)

\* trip to Plaza was 100./man to plaza, 125. from plaza = 225./per man. Higher on return since Garcia thought 5 men!



8 MARCH 1970

In the hotel around noon (Hotel Colon, Academy Bay) I saw a small, wasp-like form characteristically hovering at door posted on 2nd floor. Captured it.



I recalled today that <sup>one day,</sup> before we left for Plaza, during a discussion with Rolf Sievers, he remarked that to this day no Ecuadorian <sup>3</sup> has worked at the Darwin Station. The station has never been as crowded or active as during the present time. He also feels that the success of the national park depends upon tourism.

[should receive a copy of Dodson's Science article (see letter from Schnell) for Daniel Weber.

Tonight after dinner had a discussion with Daniel Weber, the Swiss who is studying orchids here. We talked about Alcedo. Weber has been to all the major islands with moist zones. He is spending considerable time preparing maps and aerial photos for use by himself and others at the station. We also discussed the Beagle II, which was scuttled after removing all the usable metal several years ago. The boat was really too slow. He related an accident where Mr. Perry and 2 others were stranded on the Perry isthmus of Isabela after a transact, while the boat, which was supposed to meet them, was 2 days late because of motor failure! The Perry party was camped there on the isthmus without food or water, after many hours on hot lava isthmus! It affected the mind of an <sup>old</sup> Ecuadorian who was one of the party. Anyway - the ~~Beagle~~ Beagle II had too many real problems to be usable - too slow, no refrigeration, little room, etc. The Beagle III should be better, when it arrives.

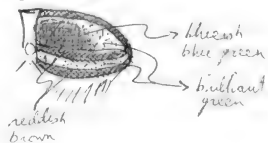
9 March 1970

This morning got up; had gummy eggs at Hotel Colon with the same thick jam on dirty rolls. Stopped by laundry on way to station - we should pick up things that weren't ready tonight sometime.

I stopped in to see Craig MacFarland this morning on way to station. He will lend me his pack (a Kelly) for use this month on the big Meeds-Fernandez climbs. (I should see Mr. Johns in 2 weeks about buying a pack from him - one he had specially made that he's bringing from Quito.)

MacFarland corroborated Mr. Johns' seeing a tortoise in Barrington; he (MacF.) says Delibes sees them there frequently. Apparently some (6, 10, 15?) were released there some time ago and may be doing well.

The Tokanids on the windows here at the station, all ♀, have this eye-pattern:



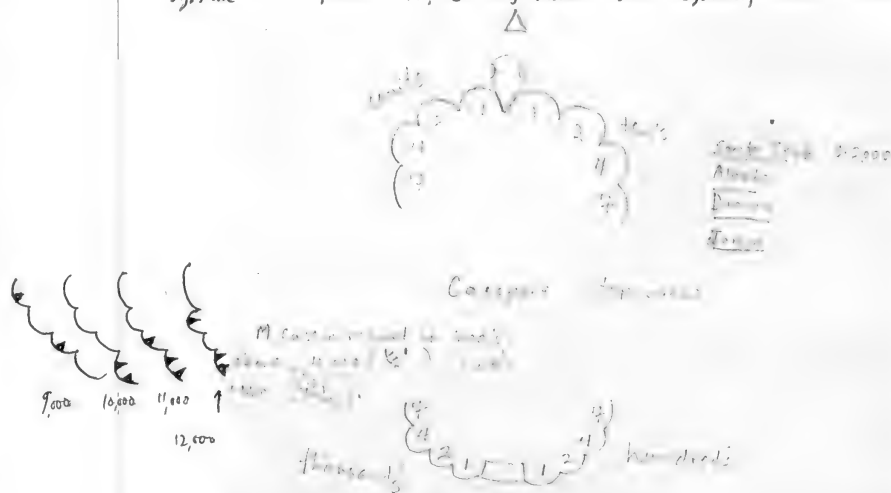
Robin gave me postcard which I need to write to Charles Schnell - 25¢ us.

9 March 1970

Craig MacFarland says that if you visit Salt mine on James Mr. Apollo(?) has information about a spring of fresh cold water about 3 miles up (or 3 hours up?!) from James Bay; he can also give information as to where to find tortoises. The company of the salt mine keeps him there as a caretaker/watchman; gets paid modestly (\$600 us./mo?) but scrapes by and often has to beg food from passing ships - he would probably be most kind esp. if we leave him some supplies and/or ask him to dine with us.

Craig also showed me system for marking tortoises (below).

Each island has its own series in the 1000's; Isabela has different series for each peak. Miguel Castro messed up system in 10,000 - 15,000 by double notch system; hard to read.



10 MARCH 1970 | Grindley, fly-pestered breakfast - eggs + sticky jam. Went over to station and found material on my desk collected by Mr. T. de Vries at Tower. In addition to 2 fish for the station collection, there was an Eristalis caught on board by Carmen, on the 'Nixe'. The rest of the material ~~was~~ was all taken at blacklight - the one I loaned him, which he ran with his generator (a "portable" Honda). There were many (smaller than the big one) acridids, 2 Calosoma (long winged), 3 Cicindela, a Bostrychid, some Cerambycids, ~~the~~ six myrmecotids, many oedemerids, a ♂ mutillid, a termite, some mirids, a few hydrophilids, and a scarab. All material was in alcohol; the ones I pinned may therefore be discolored. Mr. de Vries set up the blacklight in Darwin Bay, about 40 m. from the beach, among Palo Santo and cactus.

10 MARCH 1970

An accounting of lost or damaged items thus far is as follows

- (16 FEB) ITEMS LOST ON PLANE (see page 7)  
 (7 MAR) CABLE RELEASE OF GUNSTOCK - part lost on Plaza  
 (7 MAR) SHORT CABLE RELEASE - part lost on Plaza  
 (6 MAR?) TRIPOD BROKEN - (Frank?)  
 (before 6 MAR.) ABSOLUTE ETHANOL OPENED - (Rob)  
 (6-8 MAR?) FINE FORCEPS (ULTRAFINE DISSECTION) BENT  
 (4) - VISION II L...

A few days ago Dan Weber showed me an article in "Animals":

on a bloodsucking lepidopteran! - a member of a group of moths, the others of which feed on the eye fluids of cattle. This one has a piercing proboscis!

ref.: Ränziger, Hans. [July] 1961. The extraordinary case of the bloodsucking moth. *Animals*, 12 (3): 135-137.

species: *Calyptra eustrigata* (Noctuidae) (of "eye-frequenting moths"; visit mammal eyes (cattle, deer, elephants, man) to imitate eye discharges) - proboscis short, tapered at tip, pierces skin!

10 March 1970


Visited Fritz + Carmen Angermeyer; decided to wait for Cristobal Carrier to get supplies - about a week.

Route planned is as decided before, with a stop at Cartago Bay on the return trip; 2 weeks out.

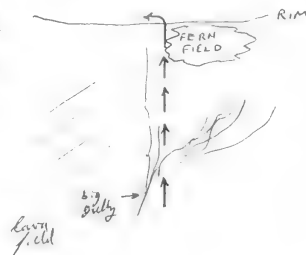
The way up Alcedo is to keep the big fern field in sight, aim for its left side. Keep big gully on left; don't cross it until about 3/4 of the way up.

Rim is split in some places;

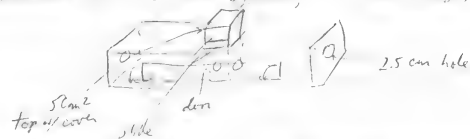
like so:  x.s.

would be  delves has put a pole up in one place; should aim for that.

I paid Fritz \$50.00 US. for Baltra trip (20 Feb.); got back 300.00 sucres; he insists he pay us full rate (owed us 30+).



11 MAR 1978 Built a cardboard box 10 cm square, 31.5 cm long, as follows.



a 2 1/2 cm hole in each end, with cover glass, door in one side, entrance port at center in crossed face 5 cm², with side for handle bar.

Caught bee (marked  $\odot$ ,  $\oplus$ ) on Scalesia left of station. lab.

Also recaptured  $\oplus$   $\#12$  there.  $\oplus$   $\#20$  immediately inactive in box.

They simply rest in darkness. Wings of  $\#12$  ragged, one antenna missing.

102

12

103

1



Daniel Weber showed me a chart (he made the illustrations for, one of many)  
entitled: "Los Mangles de las Islas Galápagos"

Rhizophora mangle

RED MANGROVE

• Prop roots

• ~~Marine~~



Avicennia officinalis

BLACK MANGROVE

• Pencil roots

4-petalled

Laguncularia racemosa

WHITE MANGROVE = JELI



Conocarpus erectus

BUTTON MANGROVE = LAND JELI

• Cone fruits



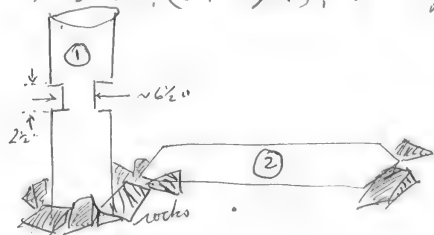




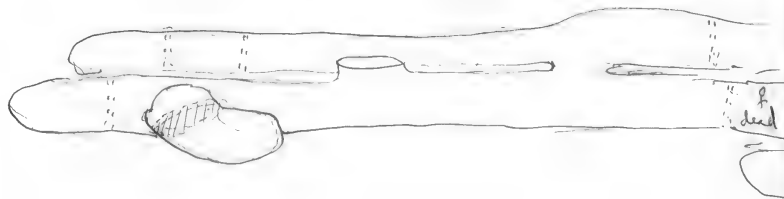
16 Mar. 1970

Today I set up 2 of the 3 balsa logs gotten yesterday at the residence of the Peace Corps workers in Academy Bay.

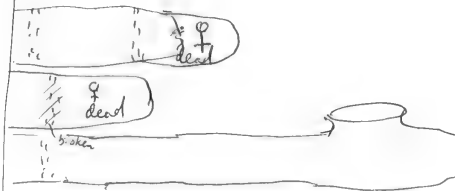
- 1) 9" diameter; 29" long, ~~set~~ set vertically, (cylindrical)
- 2) 8" side, (V triangular), 27" long, set horizontally



16 Mar. 1970

Pix of nest 2

1	2	6	7	3
9	12	8	10	11
4	5	15	13	14







46.  
(Kiloe)

Mamiya 1000 0 TL	{	(2.35)	5.17
35/1.5 + cap			
50/1.4 + cap			
2x			
tubex			
lens holder			
tripod knob			
tripod			
strap (HD)			
filter case w/ { 3-49 mm			
1 qt. water			
cable reel			
4 kgds			
lens tissue			
Plant Press	(.23)	(0.63)	1.50
Flashlight		(0.06)	.13
Film (2x rolls in bag)		(0.68)	1.50

(Σ) (8.18)



~~Calibrate HV-film w/ 35 mm lens~~

~~Photograph 1/2 cycle~~

~~Develop 7A1-Xrad~~

~~Mark 1000~~

~~Read 1000~~

~~Mark 1000~~

~~Read 1000~~

~~Read 1000~~

~~Read 1000~~

UVB

~~15 in fully~~

~~multiple~~

~~multiple~~





19 MARCH 1970

Ascent of Alcedo. Provisioning was done at the last minute; Robin took supplies out for 3 days (not 4?). Frank was seasick - his magazine didn't work well. - retched over the side just before we left. Carmen gave us supplies to eat on shore - peaches, applesauce, and coconut crackers. I 'tanked up' 1 qt. extra on water. Landed on beach around 3-4 PM, but didn't leave till around 5, since we sat around putting shoes on ~~shoes on~~ and taking pictures. The roll of film I had in my camera had its leader detached; I don't know how many or what shots I missed, but they're quite a few, including some 'taken' on beach. Pelicans and seagulls at beach, which was of dark sand. Some incipient mangrove shoots, too, including some of non-red mangrove species, with cotyledons & growing roots, pale green. Started up at 5 PM, with gully and lava flow on left. It was quite hot until sunset, after which it got considerably cooler. After about 40-45 minutes I was very hot, sweaty, and exhausted, and dizzy. I realized it was my weight, which included several pounds extra of food (Carmen's gift), the machete, my tripod, wide angle lens, <sup>some video</sup> and headlamp were cached; the other items were carried by others. Rested and ate in moonlight about 1 1/4 hours later; I hour later we stopped for the night on a steep slope (steeper than initial 2 hours). We had lost our orientation with respect to the field of ferns (seen earlier from below, and from boat [see also p. 97]); we decided to take a bearing in the AM. The slope up had consisted of

Bursera and Croton, with no cacti seen at all. Higher up, grasses and ferns became more abundant, then Darwiniothamnus (and Scaevola) where we spent the night. I collected some spiders and a few other insects; ~~not~~ a Tettigoniid moulted downslope of where I went to sleep, in a Darwiniothamnus. Night was very cold; I had on only a T-shirt and ~~short~~-sleeve <sup>yellow</sup> shirt, with my lightweight white jacket; no sleeping bag or mat; just tarp on ground and <sup>(slept little)</sup> Panchos. Sky clouded in; we were among a few gullies on both sides, in ferns, shrubs, and Darwiniothamnus. The ~~trail~~ trail up had been mostly donkey-trails; we passed quite a few groups of feral donkeys and listened to their obnoxious braying most of the night.

/ took my own advice and fastened on my lenscaps.

This has worked well ever since.



#### Photographic equipment for trip up Alcedo:

Mamiya/Sekor 1000 DTL body

Mamiya/Sekor F 1.4/55 mm lens

1 set extension tubes

doubler (2x)

lens holder, cable release, ruler, lens tissue & cleaner.

filters (2A; Y(K2); R1(GS); P(1A); B(WRATTEN); in glass; 88A gelatin)

[CACHEP: Schacht f3.5/35 mm lens; Bolux minipod]

20 MAR 1970 | Awoke at dawn; we were still clouded in.\* We had a breakfast at machica (ugh!) and started up. I led for about 20 minutes and we switchbacked our way up a steep slope; probably the clouds obscured the fact that we were only a little below the rim the night before. I didn't even realize we were at the rim when we ~~got~~ got there; I figured there must be another rise, since we had only been climbing  $3\frac{1}{2}$  hours at most; but we were on the rim. Donkeys stayed ahead of us most of the way along the rim. The rim was a little more open, in some places much more, than the slope up. Lots of Sceloporus, with many bushes, and a covering of convolvulaceae with very long, large white flowers. Also a tree-shrub with compound leaves; with leaf surface on stem, having vicious spines on the stems and trunks - would encounter this along much of the trip and I got

\* The place we had camped had many Argiope webs hung with dew.

Hand-drawn Panorama #1 - E + S. Ash.  
20 Mar 1970



some pretty bad scratches since I had no long-sleeve shirt. I mistakenly called this plant Crotalaria for most of the Akedo trip.

After a short rest on the rim (by + for me) we started towards the geyser, going south along the east rim and then west along the south rim. The rim was quite easy walking, in almost all places. Donkeys were ahead of us most of the time, and their trails were used by us almost everywhere we went. It stayed clouded in as we marched along in the morning, and then we reached the cleft. We couldn't see Dr. DeVries' pole and so we lost about  $\frac{1}{2}$  hour poking around. The correct way was found (continuing straight ahead through, past, and around the "dead-end," down the cleft and up the other side to the pole. We rested there; I collected some plants. The clouds broke and we could see the other side of the cleft, and then out to sea, and finally across the caldera floor. We travelled further along the rim; in mid-day we broke up into 2 parties - Robin and Rob went straight on towards and to the geyser; Frank and I stayed on the rim and photographed, and I collected. I did a full panorama on the rim in Pan X; Koda II + 2A; Koda II + Polar; IE + #25; IR + #12; UV (should be NG). Collected around rim, found quite a few Xylocopa ♂♂, hovering esp. over bushes of various



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some pretty bad scratches since I had no long-sleeve shirt. I mistakenly called this plant Casteln for most of the Akedo trip.

After a short rest on the rim (by + for me) we started towards the geyser, going south along the east rim and then west along the south rim. The rim was quite easy walking, in almost all places. Donkeys were ahead of us most of the time, and their trails were used by us almost everywhere we went. It stayed clouded in as we marched along in the morning, and then we reached the cleft. We couldn't see Dr. DeVries' pole and so we lost about 1/2 hour poking around. The correct way was found (continuing straight ahead through, past, and around the "dead-end," down the cleft and up the other side to the pole. We rested there; I collected some plants. The clouds broke and we could see the other side of the cleft, and then out to sea, and finally across the caldera floor. We travelled further along the rim; in mid-day we broke up into 2 parties - Robin and Rob went straight on towards and to the geyser; Frank and I stayed on the rim and photographed, and I collected. I did a full panorama on the <sup>S.E.</sup> rim in Pan X; Koda II + 2A; Koda II + POLA; IE + #25; IR + #12; UV (Should be W4). Collected around rim, found quite a few Xylocopa ♂♂, hovering esp. over bushes of various

20 MAR 1970

kindo. Females were there too, but not very abundant; they visited particularly the yellow-orange flowers of a low-growing (*Cucurbitaceae*?) herb (collected), but also other (collected) plants. I affixed a ♂ to a thread but could elicit no response from other ♂♂ into which I introduced the tethered one; they usually hovered at a distance or fled — their reaction to me, I'm sure. Frank & I moved slowly around the rim, collecting and photographing. He found some tortoise runways that were very deep (4.5 feet!), leading to a pool with many tortoises. The tortoises dig deep holes which fill with rainwater, esp. on E. and S. rims. These holes also attract butterflies, esp. *Lycaenids* and *Phobias*. *Dione* and at least 2 species of *Vanessa* were also abundant. [*Panama hercynice* was seen next 2 days — see below.] We passed 68 tortoises on the E → S rim, which was a count by 2 people walking, not particularly searching for them. Most were large, older individuals, although a few younger tortoises, less than 2 feet long, were also seen. No mites or ticks were found on the tortoises, despite my looking at the leg membrane regions of about a dozen. (Altogether, the count for the trip was 158, which included the 68 above, plus 10-12 at the geyser, plus 10-12 on the NW rim, the rest distributed here and there over the caldera floor and above & beyond the sulfur areas.) Also on the S.E.

20 MAR 1970

rim I collected a large number of plants growing as epiphytes on a tree at the place where our 2 parties split. Frank & I arrived above the geyser around 5<sup>30</sup>, and Frank found a good donkey-trail down. We could smell the sulfur-fumes as we descended; at times they could be smelt on the rim. Robin had fixed a "Maggi" soup from water of the upper geyser pool (boiled & reboiled). Frank and I reboiled about 5 quarts to replenish regular water. (I had reached the geyser on only 1 quart of water.)

21 MAR 1970

had no more. I had to wait for the next  
to replenish. I received my share on 1.1.19

neg. under west arm of table (along with  
my laptop @ dinner) went on to further deg. in

we'd meet them @ 2. Photod geyse  
g. d. geyse. hawks,  
etc. cover pool had 2 spp.

water bugs, some flies, shore bugs, tadpoles, etc. ~~They~~ Streamed for  
insects <sup>in</sup> and below ~~the~~ were in above  
except for deep insects nothing. (fish say rise  
saw something swimming below surface in upper pool)

SPEC: bees in rim, cap E-S. none other.  
 fly @ port. of bees in cat door (red)  
 4 ~~Columba~~ on rim (small, black) 1 in  
 center for (21) - bigger w/ green msc. others  
 only 1 on rim, mostly E-S.

Pl. very resinous and uses a beautiful resinous & aromatic  
style, size of candle near dryer part in  
1. Then carpenter, note. Many sometimes  
nest found, take very young of honey, white, &  
peels - red, white & purple etc. Left around 100  
to meet Nest @ Sulphur Creek (near. 10000). Trouble of  
A lot - took it. Several man scabers forest of  
Cleveland (X 4000) & grow along other living  
hands to under floor below living forests & shrubs.  
Did it see. Many cuts from, but, obvious  
a natural nests.

21 MAR 1970

The following are the results of the  
 analysis of the samples collected on  
 21 March 1970. The samples were  
 collected from the following locations:  
 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)  
 (11) (12) (13) (14) (15) (16) (17) (18) (19) (20)  
 (21) (22) (23) (24) (25) (26) (27) (28) (29) (30)  
 (31) (32) (33) (34) (35) (36) (37) (38) (39) (40)  
 (41) (42) (43) (44) (45) (46) (47) (48) (49) (50)  
 (51) (52) (53) (54) (55) (56) (57) (58) (59) (60)  
 (61) (62) (63) (64) (65) (66) (67) (68) (69) (70)  
 (71) (72) (73) (74) (75) (76) (77) (78) (79) (80)  
 (81) (82) (83) (84) (85) (86) (87) (88) (89) (90)  
 (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)













23 MAR 1970

1968.  
COLINVAUX, P. A., SCHOFIELD, E. K. and WIGGINS, I. L.

1968. Galapagos flora: Fernandina (Sanborough)  
caldera before recent volcanic event.  
Science 162. 1969.

158

24 MAR 1970

159

25 MARCH 1970

Fernandina climb 25-27 Mar '70

25- ascended cliff face v. side behind  
 rock. south. climbed above ~~to~~  
~~cliff~~ of Rln below. Fide  
 picking ~~to~~ ~~up~~ ~~climb~~ to top w/.  
 water, pack, 3 cans, pencils (2, last one)  
 & 4 cans applesauce, crackers. Ate. then  
 left. Hansen returned, ~ 1/2 mi past  
 1st lava flow (we went W, then S).  
 Reached net to

flow. saw up stream at  
 1st flow. Some time got  
 stuck down there  
 flow on. Made  
 7- stayed @ Small  
 Cave 1 of 3.  
 Hansen then went AW,  
 when not, then around NW OK.

25 MARCH 1970





one in tree #2. Ants coll'd on land  
 & clear. At out the red ants were inside  
 & clear. At out the red & black ones  
 were outside & mainly around some  
 pale yellow *Campylopus*, & some black  
*Campylopus* also coll'd. 3 others returned  
 ~ 5-6 next day, having reached summit  
 on very steep climb on black lava all the  
 way! (4 has on summit) Fire to dry clothes  
 refused next day in pm. side peaks  
 of pleasure? Nice @ 10 am. branding  
 on side, less swell, all 4 + perfect. once.  
 Coast there has composites, polioles,  
 igneous (2 kinds), penguins, scapulars, ferns  
 etc. Plants - all found flowering  
 (20 cars were visited, except none observed  
 to Mt. Casteln, or in vicinity. ~~at~~ visited  
 esp. *Adiantum* & *Walteria*, w/ some on  
*Scalera*.





27 March 1970

Expt #

27 Mar 70

Found iguana fish's placed  
off Fernandez 27 Mar 70;  $\approx 1/2$   
km in on N. side.

2 blotted 2 small  
(5 total cold but 1 dead)  
2, (1 ea. blotted + small) to 2 vials

fresh drinking water      sea water



2 min all OK + moving  
30 min all OK but mostly stiff,  
except small in FW - not  
moving but arms extended.

24 hrs later both per. dead, rabbit  
water was had legs 7 airled.  
put in alch. w/ decolorant.

27 March 1970





28 MARCH 1970

The first of the three  
 1. The first of the three  
 2. The second of the three  
 3. The third of the three

1. The first of the three  
 2. The second of the three  
 3. The third of the three

The first of the three  
 1. The first of the three  
 2. The second of the three  
 3. The third of the three





29 MARCH 1970 Arrived at Alcedo a little later than we had expected; about 3 hours crossing instead of 2. Upon arrival, I headed up in sneakers, bathing suit & T-shirt, with (no water) Bolex, and collecting kit. I had no watch so I had no idea of time, but I arrived at the cache about 35-40 min later, (my estimate). On the way up and down I noticed many things I had overlooked before, because of my heavy pack and general darkness, and misery. The punire slope is gradual, ~~at~~ and few things on it appear alive for the first 15 minutes or so going up; just Scalera affinis and Waltheria, with some Palo Santo. But there is also a ground covering of dead grasses, and some (a few), mostly dead Opuntia (donkeys?), plus Bursera & Croton, Santia, Asclepias (see below), and a few other plants. The "larch-imitator" is there; so is the 5-petalled ground flower (yellow), and a couple of shrubs I didn't recognize. In general, however, the ground appears barren of life, until you get higher, where the Palo Santo is in leaf (having gotten some rain earlier). X. darwini is all over, even at the house (~1230 pm - ~2 PM) I was up there. They were visiting Waltheria and Scalera only, esp. the former. Occasionally I passed a flowering Zycosperma, but I didn't stay long enough to see these visited (altho X.d. did visit them on Ferdinand). I collected

plants and also 3 ♀♀ of Xylocopa darwini; one of the X.d. ♀'s was injured, a natural wound - one metathoracic leg missing. It was interesting that here, in the more open country, Waltheria is even more recumbent, laying branches (with flowers) often flat across the ground. I noticed Phacelia and Danais flying; finally I saw the Asclepias I had been missing all along - it grows as a vine, coiling around itself into low, scrubby, bush-like heaps, about 3/4 m. high. The lower branches of these heaps were dead. I could find no Danais eggs, larvae, or pupae, tho about 2 dozen adults were seen flying. In checking under one Asclepias for dormant? larvae, (none found) I found a Phacelia nest. (collected some). (that Asclepias was under a Palo Santo). In addition to collecting on the way back, I took some movies, esp. of X.d. on Waltheria. I picked up ~~the~~ the cache and headed back, putting plants in the plastic bag. On my return, the things in the cache were OK, including my wide-angle lens and the headlamp.

Upon returning, I used Carmen's flipper & mask and went swimming along the rocks to the left of the landing beach at Alcedo. The water was clear and there were a great many fish, (especially the ones seen in large schools at Sta. Espinosa) pigfish (= blueish gray with high forehead and yellow tail); an angelfish-like

29 MARCH 1970

one, in black with yellow fins + tail, and a vertical white lateral stripe; a few small groupers; some sheepheads; many minnows; and Carmen mentioned that a black + yellow fish often nipped you; altho I didn't see any (cleaver-wrasse?).

We had lunch (goat-liver - great!) and headed back towards James Bay. The sea was very rough, especially compared to the aurings' calm. Santiago was deep in clouds - it was raining and the rain was almost across the bay. A full double-rainbow crossed the bay. Frank, Rob, + Robin were ashore getting drenched - Fritzy picked them up. We had goat-meat for Easter dinner, with Carmen's cake (first cake seen since Cambridge - baked aboard ship, + great). I had intended to go up ashore + blacklight in the transition zone, but the rain put that off till the next day.

30 MARCH 1970

This morning (slept below on Nixé) after breakfast Rob and Frank headed up to try to get as high as possible on Santiago; Robin left with them but said he'd be around for lunch. I went over to pick up my short boots, which were left ashore yesterday morning after blacklighting (28 mm UV), and to photograph flamingoes, etc. The salt lagoon immediately behind the beach where we landed had about 20-25 flamingoes, plus black-necked stilts and Galapagos ducks; finches and mockingbirds were also abundant. The flamingoes always kept on the far side of the lagoon as I proceeded around. Collected as I went; ~ Tapinoma melanocephala? under mangrove bark, 1.5 m above ground; Thysanura, spiders, etc. also under bark. Collected ticks off a gekko found under bark, and some Gnateracyntha in the trees. Filmed flamingoes, also some finches & ducks & sandpipers. The mangroves there were of several types; pencil roots of black mangrove were evident at the lagoon edges; also some white-flowering mangroves (4-petaled) and some with cone-like fruit; No red mangroves noticed. Fifty picked me up at about 10:10<sup>30</sup> & we hauled back across the bay. I noticed that the mangroves leave a considerable amount of litter, and that they often die, leaving room for many ground insects, but few seen. Perhaps ground is too salty. A great many fiddler crabs were present. All in all, this place reminded me much of the Bay Point area of Florida Bay (Crown Key + vic.),

with low mangroves, fiddler crabs, calmness of water,  
etc.

The hike up Pico in bathing suit left my legs very sun-burned. I can hardly bend at the knee without pain.

[illegible]

30 MARCH 1970 This morning (slept below on Nixie) after breakfast Rob and Frank headed up to try to get as high as possible on Santiago; Robin left with them but said he'd be around for lunch. I went over to pick up my short boots, which were left ashore yesterday morning after blacklighting (28 mm UV), and to photograph flamingoes, etc. The salt lagoon immediately behind the beach where we landed had about 20-25 flamingoes, plus black-necked stilts and Galapagos ducks; finches and mockingbirds were also abundant. The flamingoes always kept on the far side of the lagoon as I proceeded around. Collected as I went; ~ Tapinoma melanoccephala under mangrove bark, 1.5 m above ground; Thysanura, spiders, etc. also under bark. Collected trunks off a gecko found under bark, and some Gasteracantha in the trees. Filmed flamingoes, also some finches & ducks & sandpipers. The mangroves there were of several types; pencil roots of black mangrove were evident at the lagoon edges; also some white-flowering mangroves (4-petalled) and some with cone-like fruit; No red mangroves noticed. Farty picked me up at about 10:10<sup>30</sup> & we headed back across the bay. I noticed that the mangroves leave a considerable amount of litter, and that they often die, leaving room for many ground insects, but few seen. Perhaps ground is too salty. A great many fiddler crabs were present. All in all, this place reminded me much of the bay, Point area of Florida Bay (Cross Key + vic),

with low mangroves, fiddler crabs, calmness of water, etc.

The hike up Pico in bathing suit left my legs very sunburned. I can hardly bend at the knee without pains.

Fritio on  
Apsolo; talk  
later about  
plans

Robin - Fritio  
Midway  
Terrell / Fly C.  
for class





71 Mar Lewis  
am. ~

dry all over - green on top  
= lichen <sup>was on top</sup> Dec. to 17th Feb  
flowering = Cordia (2 ft.) ~~in mangrove~~  
Castela, Cryptocarpus, Quercus  
mangrove (black?) - w/ x'd  
♀ coll'd.

X'd nest in Cordia - ♂ escaped  
or been obviously visible. Both  
w/ Cryptocarpus + mangrove,  
dead sections + pereskia  
tall Pereskia Scorpius (S.P.) weeping.  
walked around beads <sup>low</sup> beads  
Grass hop pos. birds <sup>over</sup> beads  
beads

188

189





1. *Spodopogon*







2 APRIL 1970

(See also p. 210)

## 2 APRIL 1970 KEY TO FILM MAILER NUMBERS (MOTION PICTURE)

B 460495	#9	S. PLAZA - crabs, sealions, birds	
B 460496	#10	S. PLAZA	
B 460497	#11	S. PLAZA	
B 460498	#12	S. PLAZA	(7 MAR '70)
B 460499	#13	<del>SEE</del> X. d. ♂ + ♀	[end at 16 Mar '70]
B 460500		to Pta Espinosa #1	[#14]
B 460501		Pta Espinosa #2	[#15]
B 460502		Pta Espinosa #3	[#16]
B 460503		Pta Espinosa #4	[#17]
B 460504		Pta Espinosa #5	[#18]
B 460505		end Pta Espinosa → Santiago; porpoises off Alcedo	[#19]
B 460506		Santiago → Alcedo; porpoises. X. d. on Alcedo flowers	[#20]
B 460507		[29 Mar] Santiago; flamingoes	[#21]
B 460508		Jervis → Sombrero Chico → Duncan	[#22]
B 460509		Duncan	[#23]

all above addressed to SILBERGLIED (HARVARD)  
60-LABJ  
16 DIVINITY AVE  
CAMBRIDGE - MASS

02138

2 APRIL 1970

## KEY TO 35 mm COLOR FILM MAILER NUMBERS

(addressed same as film on p. 201)

H 484993	EH 135-20	Caseta	
H 484992	KX 135-20	Playa	
H 484930	K 135-20	Caseta	
H 484929	EH 135-20	Caseta - owl - push to ASA=400.	→
H 484932	KX 135-20	Plaza	
H 484928	KX 135-20	Plaza	
H 484933	KX 135-20	Plaza	
H 484972	EH 135-20	(before Mar. 19)	
H 484973	KX 135-20	Caseta	
H 484975	K 135-20	four 1 (E Alcedo - Fernandina - Santiago -	
H 484976	K 135-20	four 1 (Rábida - San Lorenzo - Pinzas)	
H 484974	K 135-20	four 1, (- Duncan)	
C 722209	K 135-36	four 1 (notes below enclosed) (Alcedo?)	
C 710612		(enclosed to cover cost of 36 exp. roll above)	
H 308470	K 135-20	four 1	
H 308272	K 135-20	four 1	
H 484980	K 135-20	four 1	
C 722213	K 135-20	four 1	
G 928877	K 135-20	four 1 (- Duncan)	
G 928876	KX 135-20	four 1	
H 484977	KX 135-20	four 1	
H 484978	EH 135-20	four 1	
H 484979	EH 135-20	four 1	
H 484981	EH 135-20	four 1	
H 484994	K 135-20	? (before Mar 19 - found in <sup>large</sup> same case)	

CHARLES DARWIN RESEARCH STATION  
SANTA CRUZ, GALAPAGOS ISLANDS  
EQUATOR  
21 MAR 1970

KODAK PARK  
ROCHESTER, NEW YORK

TO WHOM IT MAY CONCERN:

I AM A BIOLOGIST WORKING  
IN THE GALAPAGOS ISLANDS. HERE I  
HAVE NO OPPORTUNITY TO PURCHASE A  
"SPECIAL DELIVERY" ENVELOPE. PLEASE  
PUSH THE DEVELOPMENT OF THIS  
ROLL TO ASA=400, AND BILL ME

AT: { ROBERT SILVERGLIED  
HARVARD UNIVERSITY BIOLOGY LABS  
16 DIVINITY AVENUE  
CAMBRIDGE, MASS 02138 USA

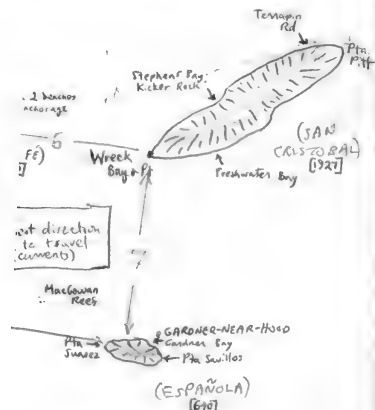
I WOULD ADMIT MY RETURN TO THE  
STATES TO HAVE THIS DEVELOPED, BUT  
I HAVE NO REFRIGERATION AVAILABLE  
RIGHT NOW, AND WE ARE ON THE  
EQUATOR - HOT & HUMID.

Thank you for your consideration

Robert Silverglied  
ROBERT SILVERGLIED

was in hours, slight overestimate,

1200/1000



1st rains, - then green.

least "due to man"

ms and swells, hard to land

can; can't land. Pta PHT: red-footed boobies

El Progreso?

do? El Junco? 4000, etc.]

; see Mockingbirds - tune!

Mr. Plazencia: and Pto. Sanillos

(Can't swim around w/ 2 men)

Black Beach: settlement; Withness (food); donkey for equipment?

[Gardner says nothing special - close to farms & water]



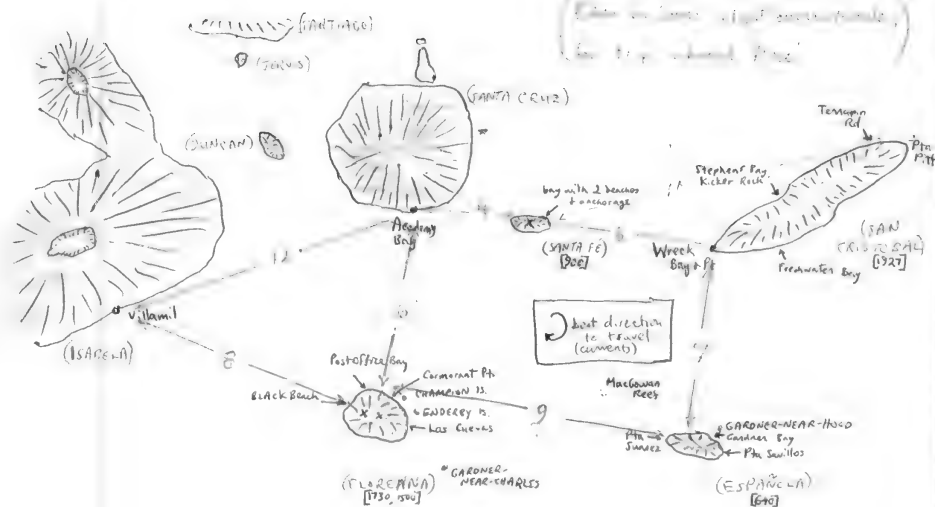
Black Beach: settlement; Wittmers (food); donkey for equipment!

[Garden says nothing special - close to farms & water]

10/11/57  
 10/12/57  
 10/13/57  
 10/14/57

(times in hours, slight overestimate,  
 for trip aboard 'Mike')





SANTA FE: most cactus dry, low; except when ~~it~~ rains, - then green.

Fritz says: "island that has changed least" [due to man]

SAN CRISTOBAL: SE shore open to sea; big breakers and swells, hard to land

Freshwater Bay = freshwater runs into ocean; can't land. P.H. res. limited breakers  
El Progreso?

Wreck Bay - supplies? [bus to highlands? El Junco? URB, etc.]

ESPAÑOLA: Albatrosses on S. shore, all along it.; see mockingbirds - tame!

MACGOWAN REEF: breakers.

FLOREANA: Las Culebras: scoria

San Juan de los Rios: red / white breakers

Champion I: mockingbirds, great rufous (can't swim, can't fly, etc.)

Commutant Pt: lagoon with flamingoes

Post Office Bay: Barred

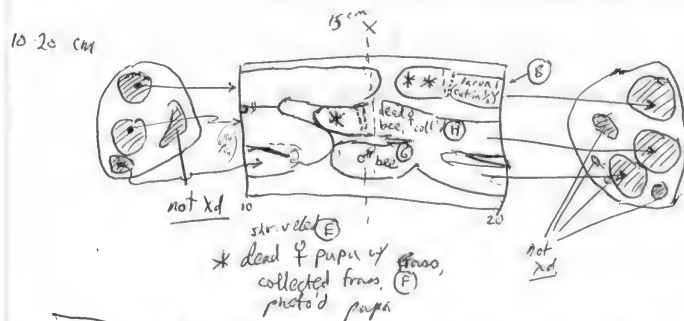
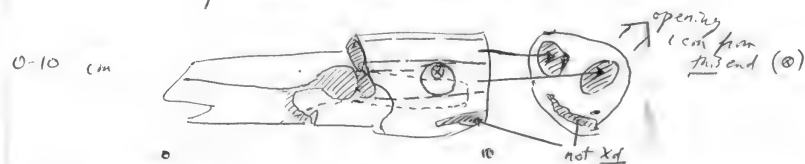
Black Beach: settlement; bitterns (food); donkey for equipment?

[Fritz says "nothing special - close to farms & water"]

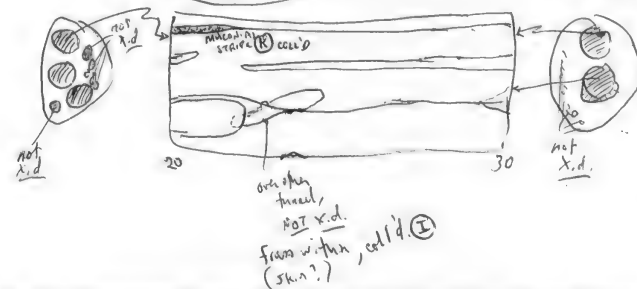




5 April 1970 Fernandina nest | opened, in > 50 cm. long piece of dead Palo Santo [photographed on Pan X], collected at site of Mar. 26, north slope on border of red lava (near tubes & 3 small cones) and black flow, about 1 hour in. Wood infested also with tunnels of termites (collected) (A)



20-30 cm \*\*\* Live ♀ pupa, collected in alcohol, frass collected (C)



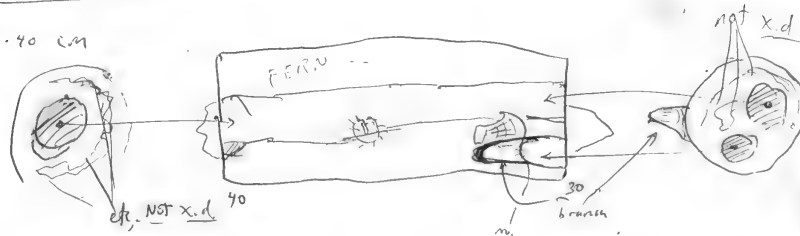
Specimens from Fernandina Nest #1 [FE-N1-A]

- A. termites (0-10 cm) [Trop. termite @ CDRS ate some] } ETOH,  $\frac{1}{2}$  DR. VIAL  
 B. larva, cut in  $\frac{1}{2}$ , by sawing (20 cm)  
 C. live ♀ pupa, in alcohol, from closed cell (15-20 cm)  
 D. frass of <sup>(CS)</sup> pupal cell, with cap (15-20 cm)  
 E. shriveled, dead pupa (10-15 cm)  
 F. frass from E's pupal cell (15-20 cm)  
 G. ♂ X.d. adult, alive + buzzing (15 cm) PINNED  
 H. ♀ X.d. adult, found dead (15 cm) PINNED  
 I. (Skin?) frass in non-X.d. tunnel (~25 cm) (DRY,  $\frac{1}{2}$  DR. VIAL)  
 J. Additional frass from E's pupal cell (15-20 cm) GENI-VIAL  
 K. mucous stripe along tunnel (at 20 cm)

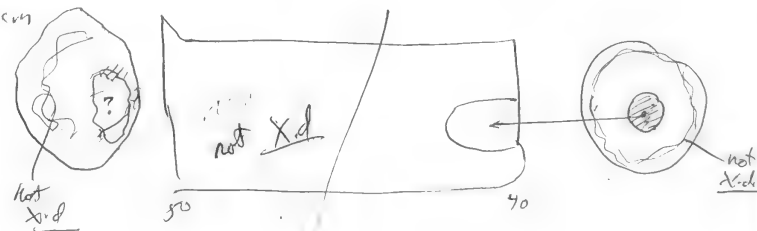
\*  
\*  
\*  
\*  
\*

Fernandina Nest 1

30-40 cm



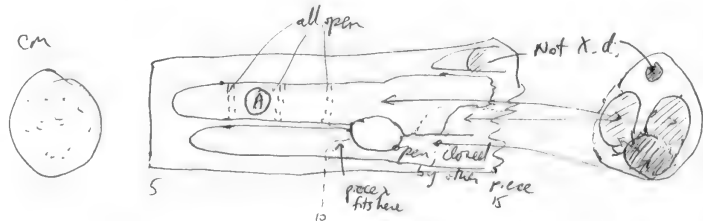
40 50 cm



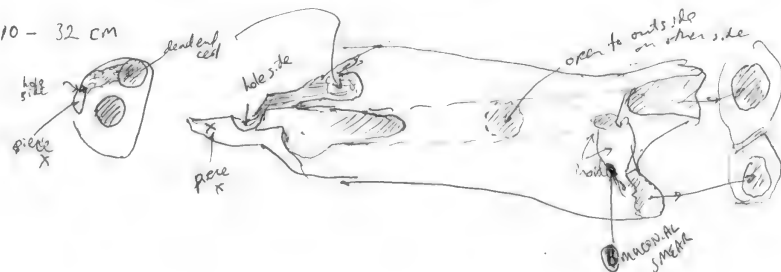
6 APRIL 1970 TAGAS COVE NEST opened, 32 cm long in what was a standing branch of an unidentified plant, but which most closely resembles Cordia to my eye. Collected March 22 at UVBL site or about 100 ft. behind UVBL towards Tagas Crater Lake. Wood did not appear to house other insects.

0-5 cm: NOTHING.

5-15 cm



10-32 cm



Specimens from Tagas Cove Nest [TC-N-A]

A Dried remains of ♀ bee, adult, in region of cells (5-8 cm)  
 B mucosal smear found at 32 cm end (34 cm)

#2

< 50 cm long

6 APR 70 ALCEDO NEST<sub>A</sub> opened; curved not<sub>A</sub> from and zone on northwest side, about 15-20 minutes from Urvin Bay. In an arched woodstock about 1 ft above ground, in a horizontal position. Bee seen to enter and hole plugged; loud buzzing thereafter but specimen got out and away aboard "Nixe". Collected 22 Mar 1970. (at the place where Frank felt ill) - first noticed (credit to:) Robin E. // NOTE H - pupa not labelled in Photo. // I - mucosal smear " " " "

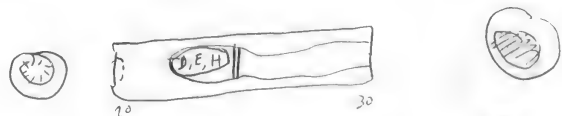
0-10 cm



10-20 cm



20-30 cm



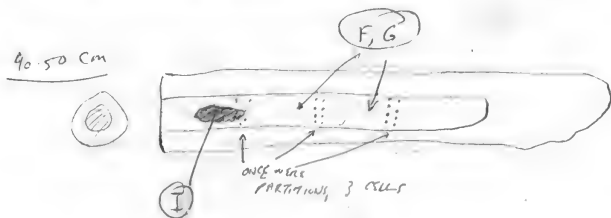
30-40 cm



6 APRIL 1970 SPECIMENS FROM ALCEDO NEST #2

[AL-N2-A]

- |   |                                  |         |                        |
|---|----------------------------------|---------|------------------------|
| A | PUPA                             | (20 cm) | ETOH                   |
| B | MITES                            | (20 cm) | ETOH (in C)            |
| C | FRASS                            | (20 cm) | $\frac{1}{2}$ DR. VIAL |
| D | MITES                            | (25 cm) | ETOH (in E)            |
| E | FRASS                            | (25 cm) | $\frac{1}{2}$ DR. VIAL |
| F | ♀ BEE                            | (42 cm) | PINNED                 |
| G | ♀ BEE                            | (45 cm) | PINNED                 |
| H | PUPA (not labelled in photo!)    | (25 cm) | ETOH                   |
| I | Mucinum Coat (labelled in photo) | (45 cm) | $\frac{1}{2}$ DR. VIAL |



6 APRIL 1970

SANTIAGO NEST OPENED; in <sup>weathervane</sup> Cordia branch, dead but still attached to tree, at UVBL site in front of Sugarloaf, James Bay. 30 MAR 70. SILVERGLADE. Located when ♀ bee observed to fly in, near dusk.

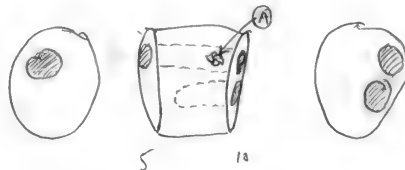
6 APRIL 1970 SANTIAGO NEST

SPECIMENS [JB-N-A]

0.5 cm

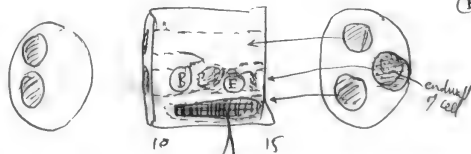


5-10 cm



A = Particulate matter, pupal skin? (ENVELOPE) (9 cm)

10-15 cm



B = SHREVELED GYNANDROMORPH PUPA, ♂ LEFT, ♀ RIGHT (ETOH) (12 cm)

C = SOLIDLY PACKED MATERIAL, UNIDENTIFIABLE (17 cm) (ENVELOPE)

D = FRASS INCL. POLLEN PELLETS, (13 cm) (GEN. VIAL IN  $\frac{1}{2}$  DR. VIAL)

E = ENDWALLS AND POLLEN WITH MIXED WOOD PARTICLES, AND LARVA OF SOMETHING (COLEOPTERA) PLUS SHREVELED SKIN(?) OF X. d. (?), all of which was hidden in this doubly-capped passage. MITES TOO. (14 cm)

E<sub>1</sub> - ENDWALLS (Envelope)

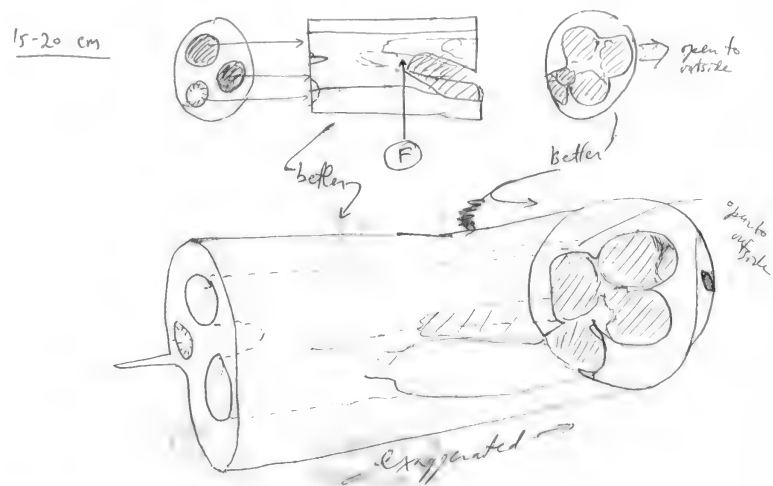
E<sub>2</sub> - MITES ETOH (GEN. VIAL W/ E<sub>2</sub>)  
[INJECTS (ANT. HUS) IN WITH MITES AT JUTE, STACRUZ CORN GATE 70.]

E<sub>3</sub> - LARVA ETOH (GEN. VIAL W/ E<sub>3</sub>)  
IN  $\frac{1}{2}$  DR. VIAL

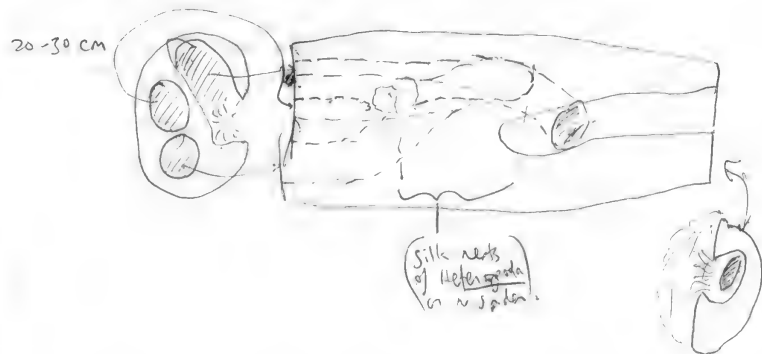
E<sub>4</sub> - POLLEN, WOOD ( $\frac{1}{2}$  DR. VIAL)

E<sub>5</sub> - SKINS ( $\frac{1}{2}$  DR. VIAL) ETOH

6 APRIL 1970 SANTIAGO NEST, CONT'D



(F) = ♀ Bee, in parts (adult), dead. [ENVELOPE]



7 APRIL 1970 ALCEDO NEST #1 opened; collected at northwestern rim of Alcedo in firewood, species unidentified; (located as buzzing in fire!), on side of rim facing Fernandina 21 Mar. 1970. Silberghied. Piece > 35 cm long; openings at 25 cm and into stock (missing) at 35 cm.

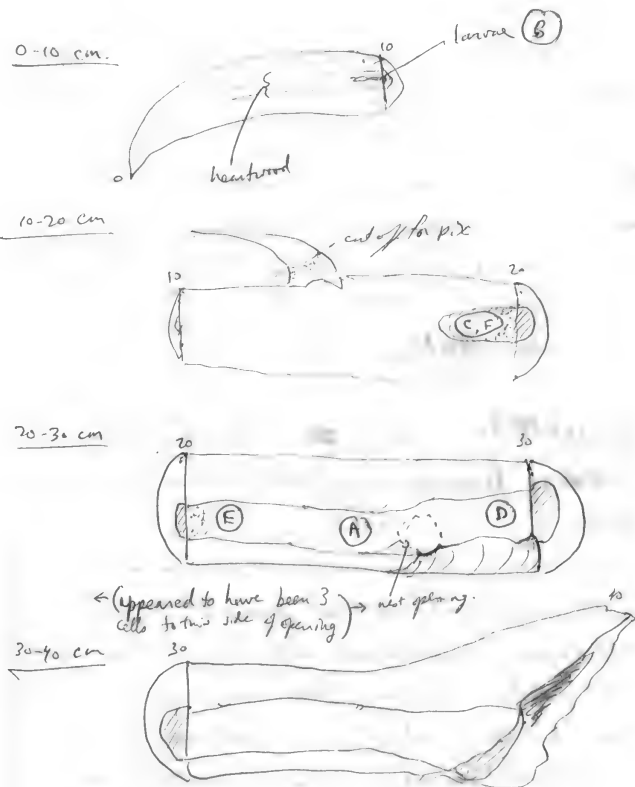
3 bees which emerged (or were present within when collected) were prevented from escaping; later found near chewed plug at c. 25, 22 cm. — these are (A) [PINNED] and (D) [PINNED] and (E) [PINNED] respectively. \*

SPECIMENS from Alcedo NEST #1

- A Bee (adult ♀) in nest, c. <sup>25</sup> cm (see above) [PINNED] \*
- B Woodboring larvae in opening eaten into heartwood at 10 cm. (in 1/2 DR. VIAL)
- C Frass found at end of tunnel for ~3-4 cm around 20 cm mark, mixed with cut pieces of the plastic bag, (which I used to plug holes; green in color), also wood particles and orange pollen granules. (in 2 1/2-DR. VIALS)
- D Bee (adult ♀) in nest c. 30 cm. (see above) [PINNED] \*
- E Bee (adult ♀) in nest c. 22 cm (see above) [PINNED] \*
- F Pseudo coll. in frass (C), [may not be even from nest, or even from Alcedo]

\* A has chewed wing margins (slight). may be parent nest-tender.  
B, C, have intact wing margins, may be freshly emerged specimens.

7 APR 1970 ALCEO NEST #1



7 APR 1970

Fernandina nests #3 A, B, C. photographed. A has many, many tunnels. Its volume, w/ + w/o air in tunnels, was measured by immersion in plastic bag + without.

with air, cylinder 2 cm x 25.5 cm DIAM  $V = \pi r^2 h = \pi (1.25 \text{ cm})^2 2 \text{ cm}$

without air, cylinder 0.9 cm x 25.5 cm DIAM  $V = \pi (12.15 \text{ cm})^2 (1 \text{ cm})$

B was another cylinder of dead Palo Santo. C was a chip of side of trunk. All were not carefully opened, since all ends of passages were visible. Collected in same place as other Fernandina nests.

JERVIS NEST opened; in piece of dead Palo Santo, diagonal in nature, knee high, on slope 1 climbed behind lagoon; 31 Mar 1970. Silbeylid piece is 45 cm long. To date 5 FF emerged from this one piece. Openings at 17 and 31 cm, and cell of additional tunnels, connected internally, exposed in broken end at 37 cm.

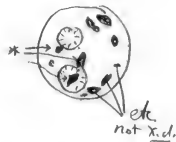
During the opening of this piece, buzzing of > 1 bees heard. Parts of a dead bee (F) and a pupal skin (A, ENVELOPE) fell out of hole at 37 cm. Frames that contained pellets (B), (2 OR. VIOL) fell out of a hole (which?). Parts of pollen ball fell out with frames of B: (C, general in D), and a pollen ball fell out of hole at 17 cm later (D, 2 OR. VIOL) (also pupal skin in D).



## JERVIS NEST, CONT'D

A ♀ bee, <sup>from</sup> adult + freshly pupa, was seen through & mutilated (E, EtoH) at 10 cm cut. It made no noise.

0-10 cm



\* non-X.d. holes filled w/ wood (at 50% by X.d. also some at end of lower tunnel @ 10 cm

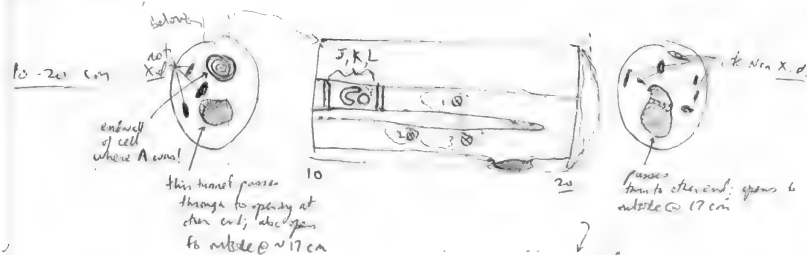
During cutting of 20 cm cut, ♀ was isolated (adult) totally in dead-end (?) cell at 20 cm. Alive & buzzing, dust covered but apparently not hurt. (F, pinned)

During cutting of 30 cm cut, ♀ was found in tunnel deep in at about 25 cm. (G, pinned)

During cutting of 40 cm cut, ♀ adult was found (H, pinned) in dead-end cell @ end of tunnel, tunnel in 30-40 cm piece, cell end in 40-45 cm piece. These 2 ♀ that I isolate at cell ends are curled up in defensive attitude & usually dust covered.

Termites found within (non-X.d. holes), esp in section 0-10 cm, 20-30 cm (I, EtoH, 1/2 & vital)

## 7 APR 1970 JERVIS NEST, CONT'D



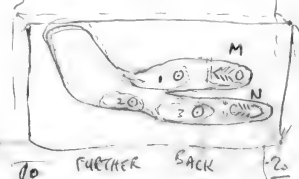
J larva

K pollen ball

L pollen pellets

Found in cell at 11 cm, proximal to cell where A was.

(EtoH, EtoH, EtoH)  
genivial m.k.



1, 2, 3 air holes,  
① opens back (into page)  
② opens forward (out of page)

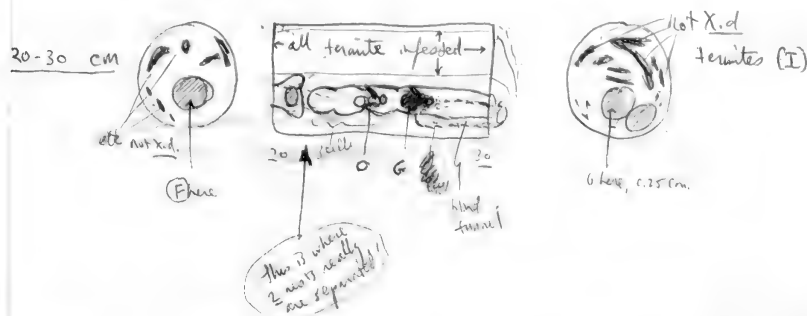
10 FURTHER BACK

see above

M } Pupae, found further back in 10-20 cm section than diagram,

N } m definitely has head distal; N fell out, may be wrong posn?

(EtoH, tube, w/n)



this is where  
2 nests really  
are separated!!



8 April 1970

Expenses

- [8 Apr. 1970] Pack from Mr. Jahn \$30.00 U.S. (trans. chs)  
 (included 1 gal. canteen, straps, cooking kit, can)
- [8 Apr. 1970] Laundry \$32.00 (sucros)  
 (rat Hercules)
- [8 Apr. 1970] Raisins, toothbrush + paste \$66.00 (sucros)  
 (Perry)
- [8 Apr. 1970] Batteries - to repl. Rols. \$7.00 (sucros)
- [6 Apr. 1970] Food @ Station (bill) \$35.00 U.S. (trans. chs)

8 April 1970

Hank and Agnes Jahn [Peace Corps; staying at Capitania, Santa Cruz]  
 161 D Street  
 Chula Vista, California 92010

Mark Deyrup; Peace Corps; Quito, Ecuador



9 MAR 1970

PHOTOS OF LIFE CYCLE (Jervis specimens <sup>usually</sup> used)

(Pan X & Koda II used; @ f/22 w/ 1 full set of tubes, lens [3.8/50] set at ∞; Flash held approx. @ camera (reg.) and set at F = 0, 23, 66, 100)

- 1) Immature adult, ♀, JE-N-P
  - a) ventral, b) dorsal, c) left lateral
- 2) Pupa, white, eyes dark, JE-N-M
  - a) ventral b) dorsal c) lateral
- 3) Larva, pollen mass, & pollen pellets (respectively) JE-N-J, B, B.
  - a) lateral <sup>B</sup> ♂, ♂
- 4) Most of Cycle, with all of 3), plus 1) and 2), plus
  - a) ♂, FE-N<sub>4</sub> (escapee) and ♀, JE-N-H.
- 5) ♂ head (FE-N<sub>4</sub>) w/ & w/o flash diffused by urethra from sheet

The other day Roger Perry described certain things seen in the Fernandina Caldera. One interesting item was that early in the morning, just before dawn, and before one could see clearly, a humming sound was heard all around them. (Shipton, Perry & Galapagos). They were ridges (?) rising from the lake. The sound mystified them at first.


NEEDED: Photos of mucous, egg, incipient nests, etc.

9 March 1970

Touget Dr. DeVries mentioned that he has seen ♂ X.d. something on Barrington. (He also mentioned that *Calosoma* <sup>sp.</sup> was present in the pellets of the short-eared owl here. This was after a discussion with him on Carabid defense.) (He also mentioned that Lygids were abundant near a tide pool on the far side of the station, but scarce where he is; [he intends to make/release some near his cabin - the first towards town from the station, small & pink, atop a hill]).

The X.d. ♂ (above) was over a Cordia lutea ("muyuyo") tree, prob. in S.-central part of the island. Time of day not remembered, but in bright sunlight (First or second of April, 1970)

Dr. DeVries has not seen the Leo at Ticon, where he spent 3 full days, crossing the island. The island had had rain, Palo Santo was in full flower. This was March 5-7, 1970.

(10 Mar. 1970)  
I worked this evening on developing, filing (Pan) of life cycle, maps, etc., mounting & labelling material, & cleaning up the lab. I also wrote a letter to Wilson, in part. At dawn, Fritz picked me up - I had no sleep. Went to sleep about 'Mise' just after sunrise. a peculiar sunrise  (Bogart and) dwindle at Barrington



After lunch, and the working out of an itinerary for this trip, (p. 236), we went ashore on the ~~more~~ left-hand beach (left of monument, as you face it). Contrast with small island incredible — no green vegetation except Scaevola and Euphorbia — no Scaevola or Maytenus seen. Some dry grasses in brownish, silt-like soil. The landing place at the beach is the outflow plain of some gullies; outwash from a year ago still made the water here turbid. A high escarpment at the left had some spots of bright green; these were the species of Scalea (Cottid, potrid) found here, with highly divided leaves, a sweet aroma, and rayless white flowers, c. 1 m. across. The fact that they are found only on cliff-faces would make one think that predation (here by goats) limits them to such a place, but Fritz tells me they grow there (only) even in the absence of goats. Since I saw some large droppings near the tree I climbed to, and in easy access of it, this may be correct. The other vegetation here is that greyish ground-cover seen on Santiago and much Cordia lutea (latter flowering). X.d. was seen at Scalea and Cordia here, the former by myself and Robin, the latter by Rob Smith.

The odor of Scalea certainly may be used by the bees — you can smell it many yards away.

I walked from the beach across to the escarpment on the left, up it, along it a short distance, and back down, returning via almost the same route.



I looked out of the way for X.d. nests, not finding any in the great many Palo Santo looked at. Finally, on the way back, I located one nest in a single branch of a large, entirely dead Palo Santo, similar to a great many other such trees looked at. A single ♀ left the nest during removal, it flew around, then disappeared, returned within 2 minutes & inspected everything in the tree, including the 'imaginary' missing branches. The nest opening was about 1 1/2 m. high, the branch at c. 45°. All tunnelled wood (whole nest) collected, about 4 m.



10 Mar. 1970

During search in dead Palo Santo & under bark, I collected some Curculionids, a Scorpion, psocids, & misc. other insects. The X.d. nest was in a termite-infested tree, with many alates ~~from~~, these collected (small, yellowish species); also other termites collected. No mites found on *Tropidurus* here, which is a brownish-or animal, laterally in strips ~~dark brown & ventral greyish brown~~ lighter brown. Mites were, however, collected on one of 2 *Schistocerca* ♀♀(?) collected; they were on the wing membranes, thorax & head. The *Schistocerca* here is a brightly-colored one.

In the evening, after dusk, set up UVBL in place indicated (p. 239 map) on small island. Used regular light too, and to look around. Some trouble w/ UVBL ignition and intensity. Poorest collecting seen in Galapagos! - Few moths, some Myrmecolepids & a cleid. Got *Tenebr.*, *Paraneurina* on ground at night; latter running furiously in trails.

11 Mar. 1970

Left Barrington early in the morning for Pta. Pitt, San Cristobal at breakfast, Carmen talked about need for project motive, and kill-stone method, in local people (or people in general). Told story of local boy throwing stones at Tortuga Bay (with Pritchard & del Rio).

Arrived at Punta Pitt late in afternoon; anchored in cove between steep hills/cliffs for night. Red-footed boobies seen; frigates abundant, some ♂♂ in courtship color red & distended, wings back, make noises when ♀♀ approached. Most frigate nests high in vegetation hanging off cliff faces.

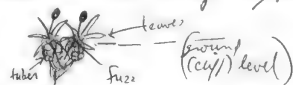
Went ashore with UVBL - (many sea lions) went back past

*Scutia* and *Gyptocarpos* and set up light(s) at cliff face back in 'canyon'. Rock very crumbly; tried ~~grapes~~ to vegetation of



Cliff face (small recumbent plants) with rock edges as supports. UVBL worked very poorly, set up 25m visible bulb & returned after dinner.

Very little material; some moths, ~~ps.~~ many myrmecolepids, 2 large hemipterids & 1 very small one, 2 ♂♂ mutillids. *Agathidium*! Collected a few plants, incl. a very strange *Compositae* (C above) in cliff face above beach.

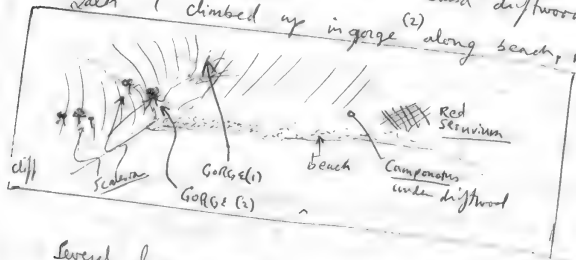




(10 Mar. 1970

12 Mar. 1970

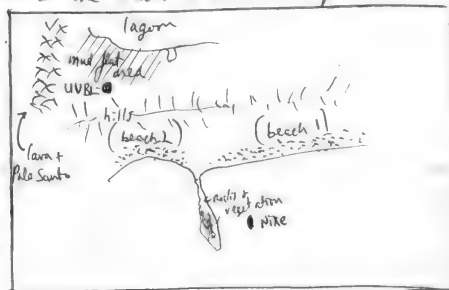
Moved from end cove at Punta Pitt to 3rd cove at beach (opposite island ~~at~~ upon which Carmen said Petrels nested). Went ashore and examined an area with very bright red Scaevola; then back inland and up a small gorge (1) collecting plants. Pale Santo in the gorge in fruit, Scaevola in flower. This Scaevola had white, rayless flowers; leaves divided but not as finely so as Barrington or Duncan. Many other plants; Crotola, Scaevola, Cryptocarpus, Scaevola, Cordia, Croton, misc. small ground plants, incl. one similar to a miniature, clustered Ipomoea. Collected a large centipede under a Pale Santo beneath a rock up the gorge. Camponotus beneath baba driftwood on beach. Later I climbed up in gorge (2) along beach, where



Several large Scaevolas grew quite low. I climbed up this gorge quite high, perhaps 2-300 feet. It is easy climbing where the erosion has eliminated all the loose, powdery material and exposed an almost polished bedrock. Finally I got to a place where I couldn't climb any more or crawled gorge, and had to get up on one of the edges to see out. Here I had to climb perhaps 15-20 feet over

cove near Pan d'Azucar, a tall, steep hill. Rocks & 2nd small cove to left. Others went up to tortoise area, about 3 hours in, past Pan d'Azucar, near the middle of the island, where they saw about 30 tortoises. I set up the light(s) at a mud flat in a lagoon, behind the beach in the area of the second small cove.

Mud flats covered with Scaevola, with rocks to left covered w/ Pale Santo. Beach area with much Capparis, some shrubs of a Gaculaceros plant, some long



12 Apr 1970

Vines, etc, etc. Sand under bushes on dunes @  
beach & behind with many myrmeloid larval pits.  
Looked around after setting up UVR; then turned on  
reg. ltr (poorly working UV) - very little later when  
returned after dinner.

13 Apr. 1970

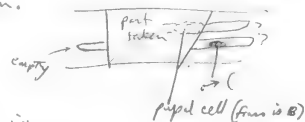
In the morning, after breakfast, I followed some donkey trails from the beach inland, to the area (indicated on pp. 249-250) where I located Xylorhiza nests in a Palo Santo. On Castela galapagensis (flowering) I collected a X. d. ♀. The vegetation, dry most of the way (except for the lagoon area = Sesuvium, etc.), consisted of halophytes & strange plants near the shore, e.g., a Cassipourea plant (p. 243), etc. — then becoming a mixed arid forest of Palo Santo and Croton

13 APR 1970

NEST 1 (Terapien Road) in thin branch of dead Palo Santo  
c. 3 m high, in lava flow area c.  $\frac{1}{2}$  km in on  
north side of lagoon; tree standing near lava flow  
that had low point with dry, algae-covered rocks  
2 ♀♀ escaped; one was recaptured (2nd) = TR-N1-A

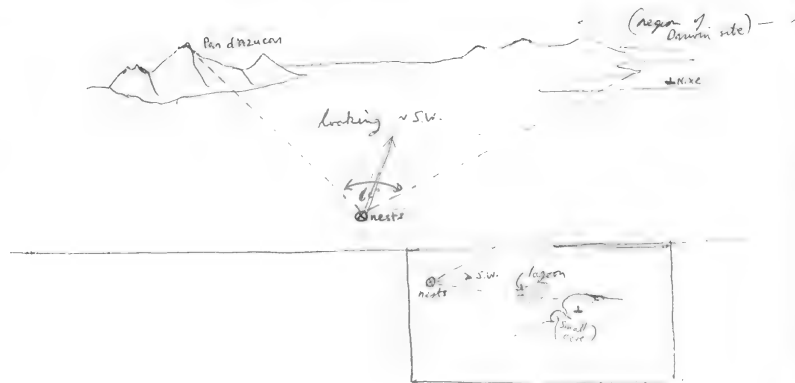
NEST 2 in same tree, in large, knee-high area of trunk.  
1 ♀ (TR-N2-A) taken from broken cell end of one piece;  
later ejected meconium (TR-N2-B), 1 ♀ (TR-N2-C)  
[and its meconium (TR-N2-D)], and 2 ♂♂ (TR-N2-E)  
(TR-N2-G) [with the meconium of the first ♂, (TR-N2-F)]  
taken from tunnel in other piece.

NEST 3 in same tree, in another trunk piece, knee high;  
♂ taken from tunnel (dead end) in part of nest; only  
part of whole nest taken.  
(♂ is TR-N3-A).  
Eggs (TR-N3-B) was taken  
from a pupal cell (with a white  
pupa that could swirl its abdomen inside) that was  
broken into from wrong end. Photos taken on  
Pan~~x~~ in field of nest 3.



Immediately surrounding vegetation [\* = flowering]:

Bursera, Croton [\*], Gossypium [\*], Scaevola, Castela [\*],  
dead annatto, algae(?).



17 April 1970

15 Am. petrel doc - saltys // then Don Posillo  
 H. petrel - strong / sailer, not sure  
 Frank - Waltera above

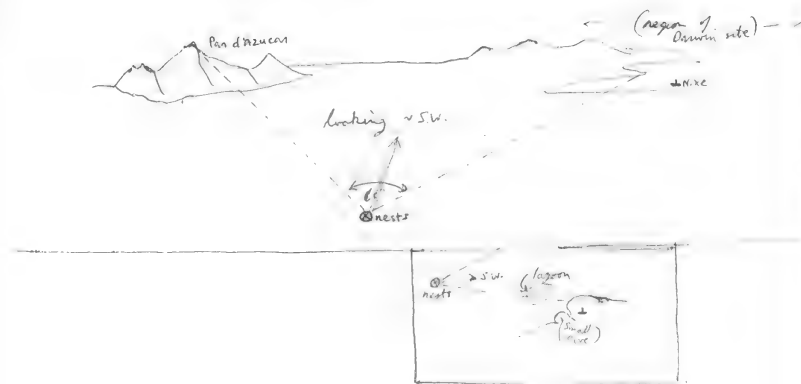
12 P. de Mucos - climbed up  
 fall  
 Terrapin Rd - others up  
 it on shore

13 Am - nests, see Castella

14 Am - 3 - others down - Robt  
 Robin lost, 2 1/2 h. later  
 Manilla to go to Benavente tomorrow

14 Am - let out Frank - Diego  
 on shore - lower / air area  
 Hobbita, veget. X. d. on  
 Phacopora, mites on k. Tropid.  
 Cactus fruit, pix. then by Carr. Bay's  
 alder, bushes, rich pressed  
 plants, black bay - 1000 to 1500  
 Paper - dinner (lobster) - 1000





14 April 1970

(14)  
*Halobates* also m.p.s.

f.x @  $1/25$  then  $1/50$  sec  
 miss by  $3/4$  — f2.8



oiling  
 head → 1 → 2 → 3

to 1st, raise on 20, 30, 3, 10  
 out 1 on 2

to 1st, raise on 10, 20, 30, 1

oil on 3, 1/2

copul. 2 holds w/ 1

2 & 3 don't or seldom. decap. water

14 April 1970. Watched + made movies + neg. pix of Halebatos captured earlier, done mostly aboard hovering boat in bucket of sea water. Cleaning, oiling, skating + mounting observed + photographed.

Most of neg. pix. @  $\frac{1}{125}$ - $f/4$  to  $\frac{1}{500}$ - $f/8$

Oiling procedure: Head  $\rightarrow 1 \rightarrow 2 \rightarrow 3$

to oil 2, raise on 2-opp, 3-opp, 1-opp and 3;

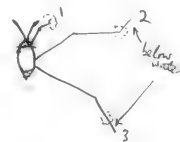
oiling on 2 with 1

to oil 3, raise on 1-opp, 2-opp, 3-opp, and 1;

oiling on 3 with 2

Copulation (mounting):  $\sigma^7$  holds  $\text{f}$  with 1's;

2's + 3's don't or seldom touch water.



254

255

el/la: Presentación de la Unidad y Tema del Proyecto  
a) de 01.01 a 30 Septiembre:

**ATTACHE:** Decreto Ley de Excepción, que se refiere al Decreto 8217 de Julio de 1964, atribuyendo a los militares de Fuerza Armada de Guayana - para combatir las infracciones, de su jurisdicción - en contra de la Ley que los Armas Militares de Guerra y Armamento de la

Los sumos, tanto de las autoridades del Gobierno de Nación o de Guaymas, de los partidos nacionales o extranjeros, en el caso de Guaymas que se reunen en la sala de sesiones de este ayuntamiento, a partir de esta fecha están obligados a dar lugar los señores de honor a comparecer y a ser recibidos, tomando asiento en el escritorio Oficial No. 23 de la sala de sesiones de observación de la sala y a una de las dos sillas que forman la parte del escritorio de la sala y que pertenecen al honor.

Art. 2º.- Publíquese en todo el territorio de Cádiz la  
orden y captura de los cinco poliz autueros y vicio que son os-  
curo del conchabado.

NOTA: Señales (verde, roja, azul, amarilla, blanca) en los edificios y en las calles para indicar la ubicación de los edificios y las calles.

[illegible]

1992) follow the structure of labor market imperfections in labor demand and labor supply.

Je pars de la montagne le 20.01.1944. Je  
trouve les deux crânes, et les deux os  
de la mâchoire inférieure, et les deux os  
de la mâchoire supérieure, et les deux os  
de la mâchoire inférieure, et les deux os  
de la mâchoire supérieure.

1. Los reporteros que informan en los periódicos que los  
sindicatos son el enemigo de la libertad económica, los  
que una vez se equivocaron al decir que los sindicatos

1. 1980年10月10日，在北京市召开的“中国人口科学讨论会”上，中国科学院人口研究所、中国人民大学人口学系、中国人口学会等单位的代表，就人口科学研究的现状、问题及今后发展方向进行了广泛而深入的讨论。会议认为，人口科学是一门综合性很强的交叉学科，它涉及到社会学、经济学、历史学、地理学、统计学等多个领域。当前，我国人口科学研究正处于起步阶段，需要进一步加强基础理论研究和应用研究，提高研究的科学性和准确性。会议还就如何建立和完善人口科学的研究体系、培养专业人才、开展国际合作等问题进行了探讨。会议最后形成了一份《中国人口科学讨论会纪要》，对今后的人口科学研究提出了具体的建议和意见。

c). Los turistas que tratan de llevar fuera del territorio Insular animales vivos, cualquier especie de pesca, están vieren prohibidos, serán sancionados con el decomiso de dichos animales y una multa de cien a mil sucres.

3.- Todos los buques o embarcaciones que trafiquen por aguas del Archipiélago de Colón, así como también los pasajeros serán revisados en cualquier momento para el mejor cumplimiento de esta disposición.

DIOS, PATRIA Y LIBERTAD

CEZAR MOSQUERA AGUILAR,  
Capitán de Corbeta IN.  
COMANDANTE DE LA II ZONA NAVAL.

Cost 19/1aes.-

DEPARTAMENTO DE LA GUERRA Y FUERZA NAVAL

Representación de la Fauna y Flora del Archipiélago de Coto y de Galápagos.

Decreto Ley de Emergencia, por el cual se reformó el Decreto N° 17 de Julio 4 de 1959, atribuyendo a los Comités de Puerto el carácter de Jueces para conocer de las infracciones que se cometan en contra de la Ley que declara Parques Nacionales y Reserva el Archipiélago de Coto.

Se acompaña de tres los habitantes del Archipiélago de Coto y de Galápagos, de los parques nacionales o en virtud del Decreto que se sanciona en la ley este comunicado a través de esta fecha estoy en los Comités de Puerto, el cual es el primer constante en el Registro Oficial N° 373 de 1959, sobre la representación de la Fauna y Flora de las que forman las islas del Archipiélago de Coto.

Se acompaña de tres los habitantes del Archipiélago de Coto y de Galápagos, de los parques nacionales o en virtud del Decreto que se sanciona en la ley este comunicado a través de esta fecha estoy en los Comités de Puerto, el cual es el primer constante en el Registro Oficial N° 373 de 1959, sobre la representación de la Fauna y Flora de las que forman las islas del Archipiélago de Coto.

DATE: 11-11-68 TIME: 10:00 AM FROM: J. W. H. TO: J. W. H.

Presentación de la Prima y Carta del Archiducado  
de Colón o de Calpeper.

secreto Ley de Emergencia, por el cual se reformó el Decreto 17 de Julio 4 de 1934, atribuir a los Asistentes de Puerto el carácter de Jueces Conciliadores de las infracciones que se cometan contra la Ley que declara Reservas Nacionales y Reserva al Indígena de la Nación.

ars contemplativa de la Iglesia católica de  
Colón y de la diócesis de las Indias. nacion.  
con virtud del Decreto que se mandó en la  
este comunicado, a fin de que este tema estoy  
de los letrados de la... y de la... y de la...  
na constante en el Decreto Oficial N.º 373 de  
75 sobre la preservación de la Tierra y la...  
terras que forman las islas... y el... de  
actualmente dice:



258

259



1890

1891

1892

1893

1894

1895



Gift

Gift

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Jeffrey Ashe 250 Walden<sup>St</sup> Cambridge  
 Joe Haratani - Ada (w/c) Guy  
 Richard  
 Berkey.

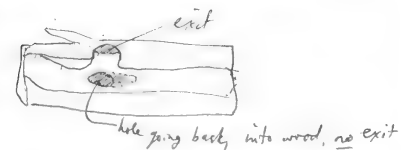


27-28 April

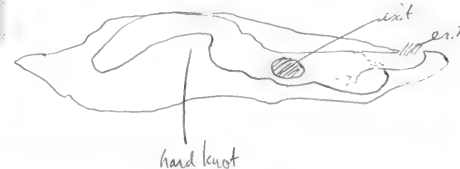
ISLA CHAMPION  
 XYLOCOPA DARWINI, OLD  
 NESTS 1 (UPPER) AND 2  
 (LOWER), IN Cordia LUTEA  
 (OLD DEAD TREES).  
 COLLECTED WITHIN CALDERA  
 FLOOR, ON END FACING ISLA  
 ENDERBY. NESTS HAD BEEN  
 ABANDONED; BEES WERE  
 OBSERVED VISITING PROSOPIS  
JULIFLORA (?); NONE COL-  
 LECTED. 20 APRIL 1970.  
 R. SILBERGLIED.

(NO SPECIMENS TAKEN FROM  
 EITHER NEST.)

NEST 1 = 8 cm. long, diam = 4 cm.

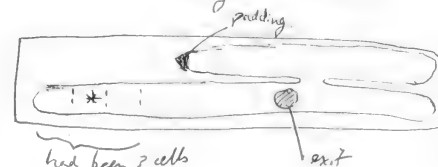


NEST 2 = 23 cm long, diam = 4-6 cm.



ISLA ESPAÑOLA  
 XYLOCOPA DARWINI, OLD  
 NESTS 1 (UPPER) AND 2  
 (LOWER), IN Cordia LUTEA  
 (OLD DEAD TREES). COLLECTED  
 IN VICINITY (WITHIN 0.5 KM)  
 OF PENINSULA 6 KM ENE OF  
 PTA. SUAREZ. NESTS HAD BEEN  
 ABANDONED; NO BEES OBSERVED  
 FLYING ON ISLA ESPAÑOLA  
 DURING VISIT. 18 APR. 1970.  
 R. SILBERGLIED.

NEST 1 = 25 cm. long, 4.5 cm. diam.



\* material appears to be compacted  
 fecal pellets of animal = NOT X.d.

NEST 2 = 25 cm long, 6 cm. diam



28 April 1970

ISLA SANTA FÉ  
 XYLOCOPA DARWINI, NEST IN  
 DEAD "PALO SANTO" (= BURSERA  
 GRAVEOLENS). COLLECTED ON  
 ISLA SANTA FÉ WITHIN 0.3 KM  
 OF SHORE, AND BELOW THE MAIN  
 CLIFF, AT THE ANCHORAGE ON  
 THE NORTHEAST CORNER OF THE  
 ISLAND. BRANCH WAS AT AN  
 ANGLE OF ABOUT 45°; NEST  
 OPENING ABOUT 1.5 M ABOVE  
 GROUND. 10 APRIL 1970.  
 R. SILBERGLIED (NOTES, P. 239)

c. 100 cm. long  
 diam. 4-6 cm.

see notes, p. 239

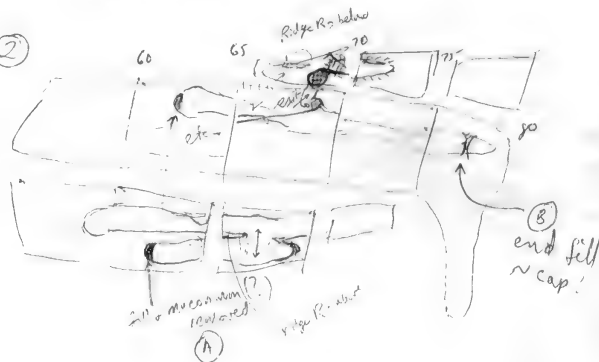
2 nests, only in section  
 (0-20 cm) and (50-80 cm)  
 (1) (2)

NEST (1)

0-20 cm. no specimens therein.

0 end had 2 cells; other side had 1 (or more?)

NEST (2)



## SPECIMENS FROM BARRINGTON (SANTA FÉ) NEST

- BA-N2-(A) fill from c. 62 cm, w/ mucinum (?) (in 1/2 dr. vial)  
 BA-N2-(B) end cap (photo) (pinned)

28 April 1970

ISLA FLOREANA (= SANTA MARIA)  
 XYLOCOPA DARWINI, NEST IN CORDIA  
 LUTEA (STANDING DEAD TREE)  
 COLLECTED 0.5 KM FROM COAST AT  
 LAS CUEVAS, ON EAST SIDE OF  
 DRY STREAMBED. NEST OPENING  
 ABOUT 1-2 M ABOVE GROUND,  
 BRANCH AT AN ANGLE. 20 APRIL  
 1970. R. SILBERGLIED.

nest 29 cm. long  
 4.5 cm = diam.

simple nest, 1 tunnel w/  
 central exit; structure easy  
 from photos.

## SPECIMENS from (LC) LAS CUEVAS NEST

- (A) [LC-N1-A] ♀ adult, in 10 cm. end, at end pinned  
 (B) [LC-N1-B] ♀ adult, in 10 cm end, at end pinned  
 (C) [LC-N1-C] ♀ adult, in 20 cm end, at end pinned  
 (D) [LC-N1-D] mucinum of B, ejected on table; collected  
 w/ toilet tissue in genital (pinned)

ISLA SAN CRISTOBAL (= CHATHAM)  
 XYLOCOPA DARWINI, NEST 1 OF 3  
 IN DEAD, STANDING "PALO SANTO"  
 (= BURGERA GRAVEOLENS), COLLECTED  
 ABOUT 0.5 KM FROM SHORE AT "TER-  
 RAPIN ROAD", N OF "PAN D'AZUCAR"  
 AND E OF LAGOON, IN THIN BRANCH  
 OF TREE ABOUT 3 M ABOVE GROUND.  
 13 APRIL 1970. R. SILBERGLIED  
 (NOTES, PAGE 249).

nest 26.5 cm long  
 2.5 cm = DIAM

simple nest, 1 tunnel w/  
 central exit, structure easy  
 from photos.

cell at 20 cm: dry pupa, w/ fecal pellets, silk + larva.

## SPECIMENS COLLECTED from TR-N1

- TR-N1-(A) fecal pellets, free in cell (genital w/ B)  
 TR-N1-(B) Pupa, w/ silk, fecal pellets, grey mould? (1/2 dr. vial)  
 TR-N1-(C) larva of ? that was in ~~the~~ pupa (B) in cell;  
 prob. made silk. (in ETOH in genital in 1/2 dr. vial)

29 April 1970

## KEY TO FILM MAILER NUMBERS



(See also pp 201-202)

[motion picture] (addressed as on p. 201)

- |          |     |                                       |
|----------|-----|---------------------------------------|
| B 460518 | #24 | Duncan → Punta Pitt, Terrapin Rd.     |
| B 460535 | #25 | Terrapin Rd → Cerro Brujo (Halebates) |
| B 460536 | #26 | Cerro Brujo → Kicker Rock             |
| B 460537 | #27 | Kicker Rock (boobies) → El Junco      |
| B 460538 | #28 | El Junco → Bahia Whet                 |
| B 460539 | #29 | Espanola → Pta Suarez                 |
| B 460540 | #30 | Pta Suarez #2                         |
| B 460541 | #31 | Pta Suarez #3                         |
| B 460542 | #32 | Gardner m. Chas. → Las Cuevas         |
| B 460543 | #33 | Las Cuevas → Champion                 |

29 Apr. 1970

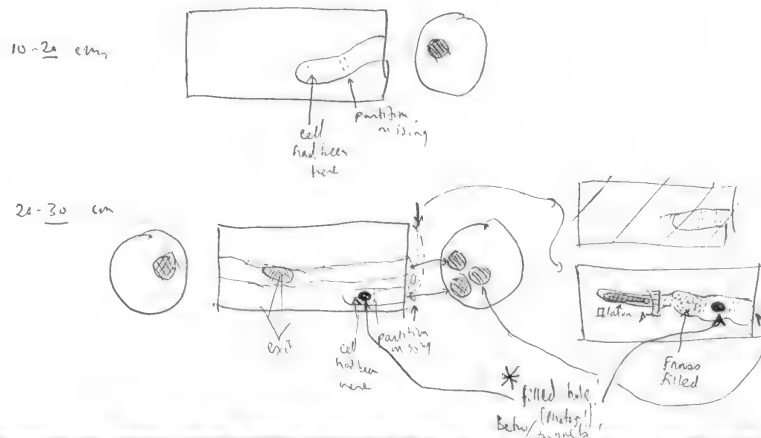
ISLA SAN CRISTOBAL (= CHATHAM)  
 XYLOCOPA DARWINI, NEST 3 OF 3  
 IN DEAD, STANDING "PALO SANTO".  
 (= BURSERA GRAVEOLENS), COLLECTED  
 ABOUT 0.5 KM FROM SHORE AT "TERRA-  
 PIN ROAD", N OF "PAN D'AZUCAR" AND  
 E OF LAGOON, ABOUT 0.5 M ABOVE  
 GROUND IN THICK TRUNK. 13 APR. 1970  
 R. SILBERGLIED (NOTES, PAGE 249).

nest   
 in part only  
 - No EXITS,  continue in  
 other parts of trunk. See  
 field photos (FX)

SPECIMEN: [TR-N3-A] dead pupa, pinned; (fire ants on in Santa Cruz @ CDRS) - a cast (Dermostid?) skin was seen in cell but blew away.

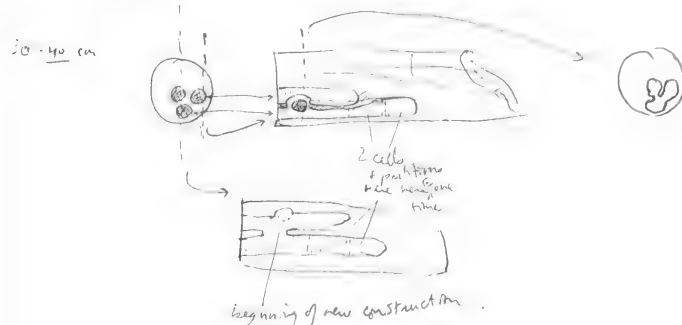
ISLA FLOREANA (= SANTA MARIA)  
 XYLOCOPA DARWINI NEST 2 OF 3  
 IN DEAD, HORIZONTAL (ON-GROUND)  
 "PALO SANTO" (= BURSERA GRAVEO-  
 LENS); TREE HAD AT LEAST 4 OTHER  
 NESTS WITHIN. LOCATED ABOVE  
 CRUZ FARM (FORMERLY FARM OF  
 F. RITTER, = "FRIDO" OR "LAS  
 PALMAS"); ABOUT 800 FEET.  
 22 APRIL 1970. R. SILBERGLIED

nest ~ 40 cm long, 7.5 cm DIAM  
 actual nest in parts 10 cm - 30 cm.





Note that in 20-30 cm. section hole in center @ 30  
leads to tunnel w/ 2 cells, end of which was frass-  
filled, then passage; then larva of ? (bee, colep?) [88-N2-A]  
in nest, long chamber. Note filled hole (!) (\*) between  
tunnels!!!



partition indicated. & descr. above separating larva from cells is  
solid work; larva, ... shouldn't be x'd.!  
appears to be isolated - how'd it get in?  
area marked "frass filled is so, but compacted", formerly  
a used, partitioned cell!

[2 MAY '70] FILM (35mm) MAILER NUMBERS

C 722208 }  
H 484927 } 9 April - bee life cycle.  
H 484931 }

30 Apr. 1970

ISLA FLOREANA (= SANTA MARIA)  
XYLOCOPA BARVINI, NEST IN  
DEAD "PALO SANTO" (= BURSERA  
GRAVEOLENS); NEST 1 OF 3  
COLLECTED; TREE HAD AT LEAST  
4 MORE NESTS WITHIN. TREE  
HORIZONTAL ON GROUND. LOCATED  
ABOVE CRUZ' FARM (= "FRIDO" OR  
"LAS PALMAS"; FORMER FARM OF  
F. RITTER); ABOUT 800 FEET.  
22 APRIL 1970. R. SILBERGLIED.

Nest in section ...  
diameter c. 7 cm.

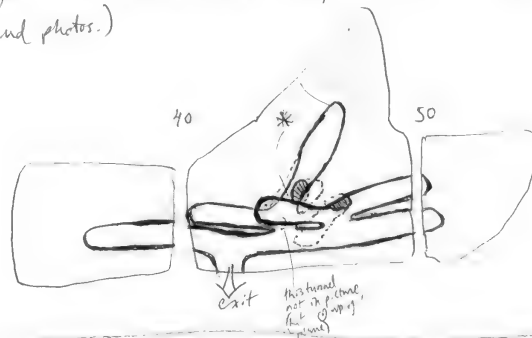
Actual nest in segments

34-52 cm, ...

+ 42 cm.

structure simple; got from photos.

No substantial contents; newly emerged bee [88-N2-A]  
hiding in area around blind tubes, c. 44 cm. (\*)  
(no end photos.)



ISLA FLOREANA (= SANTA MARIA)  
XYLOCOPA BARVINI, NEST 3 OF 3  
IN DEAD, HORIZONTAL (ON GROUND)  
"PALO SANTO" (= BURSERA GRAVEOLENS);  
TREE HAD AT LEAST 4 MORE NESTS  
WITHIN. LOCATED ABOVE CRUZ' FARM  
(FORMERLY FARM OF F. RITTER, "FRIDO"  
OR "LAS PALMAS"); ABOUT 800 FEET.  
APRIL 1970. R. SILBERGLIED.

Nest; in section 40 cm long  
diam. = 8 cm

structure simple, got from photos

Note: no pollen balls, fecal pellets

from Floreana! - monocomm only - p. 309

nest in 0-30 cm segments, + 2 small pieces at 0 and. (no. end photos).  
all on one side of block.

30 April 1970

ISLA SAN CRISTOBAL (= CHATHAM)  
 MYCOPHA DARWINI, NEST 2 OF 3  
 IN DEAD, STANDING "PALO SANTO"  
 (= BURSERA GRAVEOLENS), COLLECTED  
 ABOUT 0.5 KM FROM SHORE AT "TER-  
 RAPIN ROAD", N. OF "PAN D'AZUCAR"  
 AND E OF LAGOON, ABOUT 0.5 M  
 ABOVE GROUND IN THICK TRUNK.  
 13 APRIL 1970. R. SILBERGLIED  
 (NOTES, PAGE 249).



larva seen through @ 40  
 [TR-N2-H]

At least 2 real nests in log; one with  $\geq 1$  opening at  
 c. 40-42 cm [above] the other isolated in the  
 0-30 cm piece, (< 0-20 cm), with opening at  
 15 cm.

Pupal skin and fecal pellets fell out of 15 cm opening, put  
 into envelope [TR-N2-I]

Parts of an adult bee fell out of cut at 10 cm, when  
 made [TR-N2-J] (envelope)

Other nest (open @ c. 42 cm) is from 29- < 50 cm.

nest 70 cm. long

Dim. c. 8-10 cm.

opening at 15 cm, also  
 large opening? at

c. 40 cm, [one def @ 42 cm]

TR-N2-C, E, G vic 40 cm.

[log broken at 40 cm]

SEE NOTES p. 249

Nest 0-20 cm is very simple; set from photos. ♂ pupa [TR-N2-K]  
 at terminal end of tunnel, with ♀ imm. adult [TR-N2-L]  
 sub-terminal; see photo. (In photo; ♀ dead, ♂ pupa alive.)  
 [TR-N2-K] ♂ PUPA to be kept alive & photo'd daily for  
 life cycle preserved in ETOH.

Nest in 32-50 cm section EXTREMELY DIFFICULT, complicated.

40-50

50

40



40-30

40

30



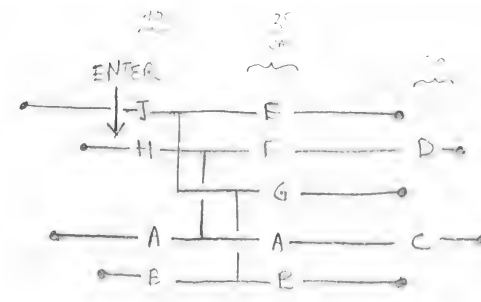
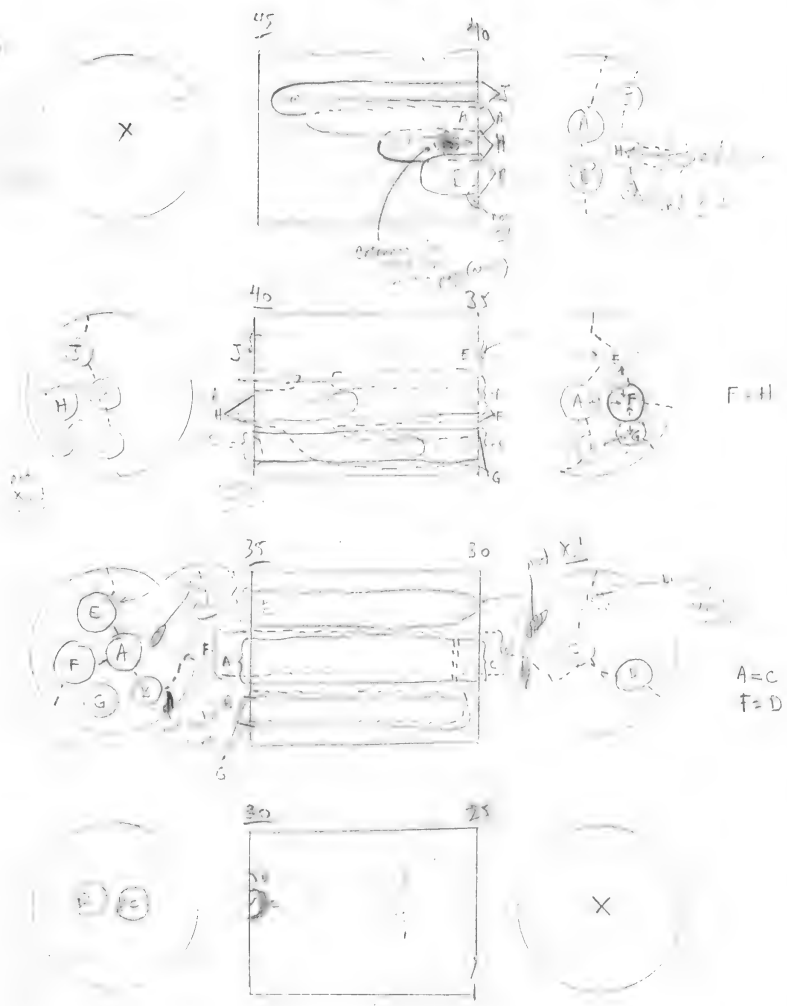
30-20

30

20



see next page



G. ... = "Bunge" (x d) = (5 2 11)

...

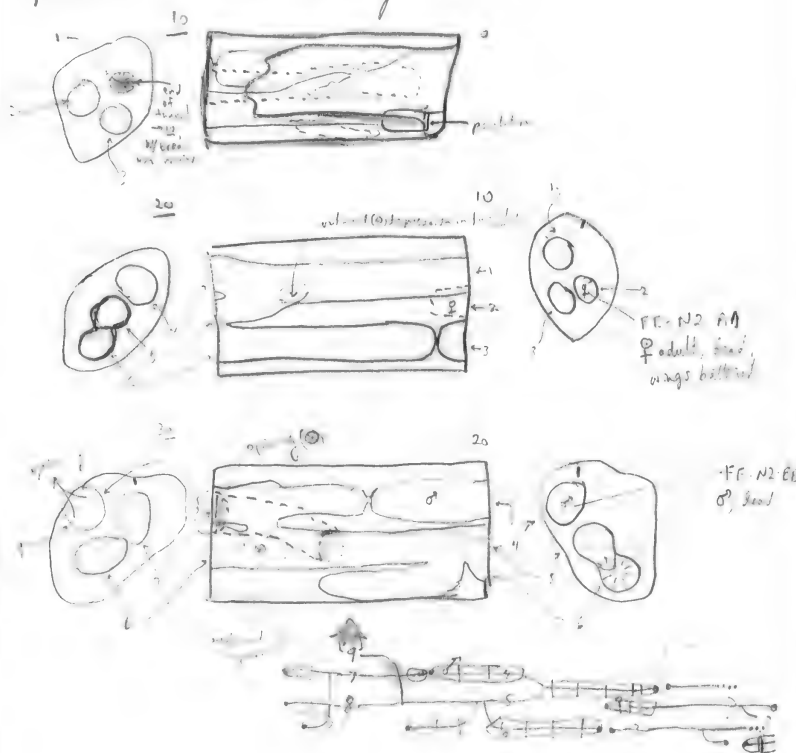
...

2 May 1970

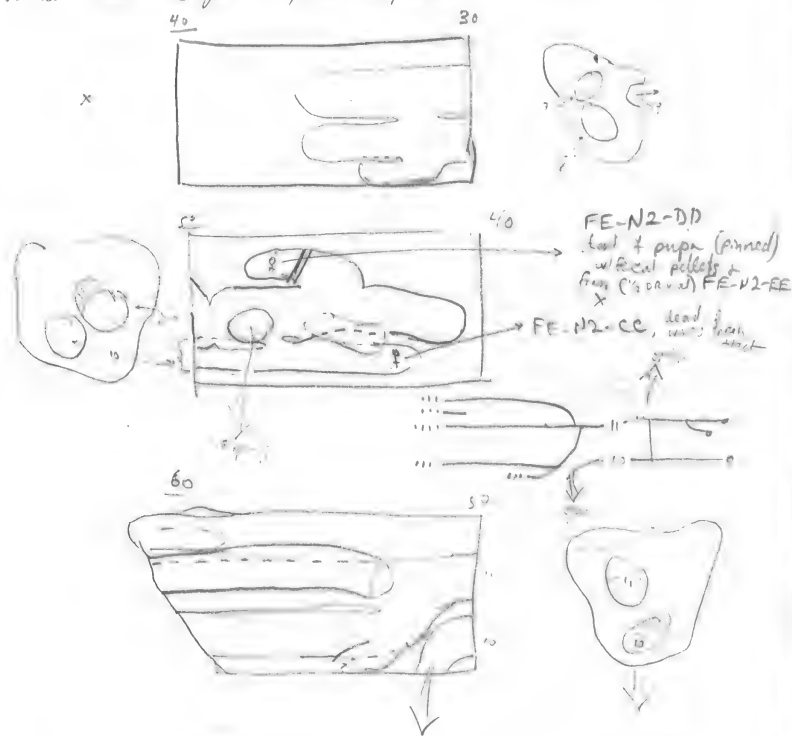
FERNANDINA - NEST 2  
XYLOCOPA DARVINI

piece 60 cm. long  
diam. ~ 5-6 cm.

Wood irregular and old. openings to outside at  
0 cm (many at end), 29 cm., 39 cm (start),  
49 cm., 51 cm., end-many at 60 cm.  
Separate nests on either side of 40 cm.



Since I don't remember how many FE-N2- specimens were taken, specimen taken from the nest are labelled double (AA,...) so as to avoid confusion w/ earlier specimens.



1

[illegible]

1. 1. 1.

1. 1. 1.

1 May 1953

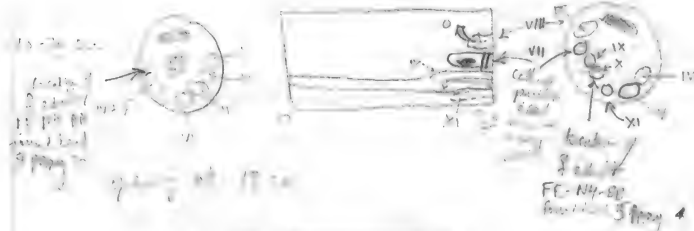
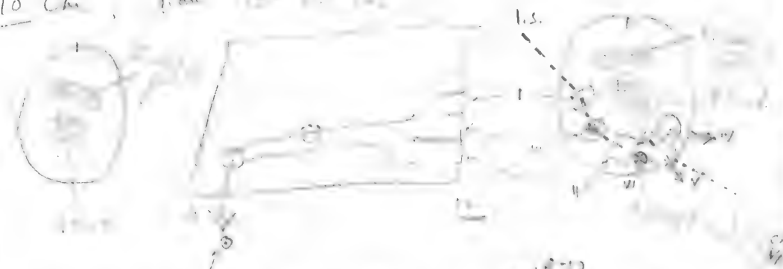
1 May

FERNANDINA - NEST 4  
XYLOCOPA DARWINI

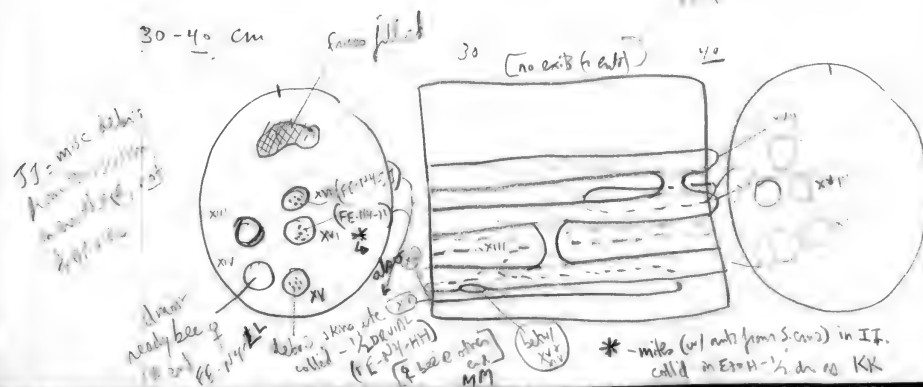
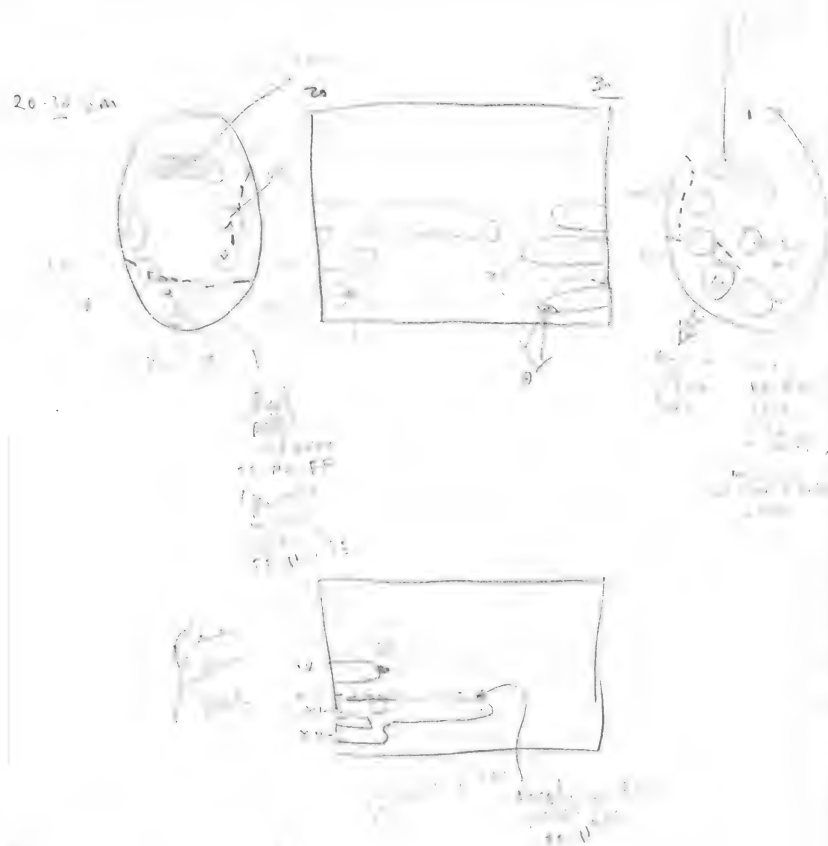
4 May 1953

see also notes, also in 31 May - 1953  
the nest is located at base of tree, 10-15 m tall  
to west of road - in a small tree

0-10 cm from 15-20 m







notes taken - photocopied from RE-04-11  
R. Perry has corresp. w/ Hays (Brit. Mus) re notes of  
composites & results.  
send. takes & notes of reptiles to: Koblis (H&M)  
Southern Director, exp. in J. and Exp

Alan H. Hayes (Zephyrus of Tanager)  
D of E, EM (N+), Cornwell Rd, L<sup>mn</sup>, SW 7, Eng<sup>l</sup>  
RE, Rojo Bay. (cont'd) / FGL)

References to trucks & suits

Hoogstraal, Harry and Glen M. Köhls, 1966.

Angas (Microagas) transversus Baites (New  
subgenus) (Xanthodidae: Angasidae), a common

Parrots of the Galapagos Grant Tribune

redescription of the holotype male & description  
of the larva. Ann. ESA, 59(2): 247-252.

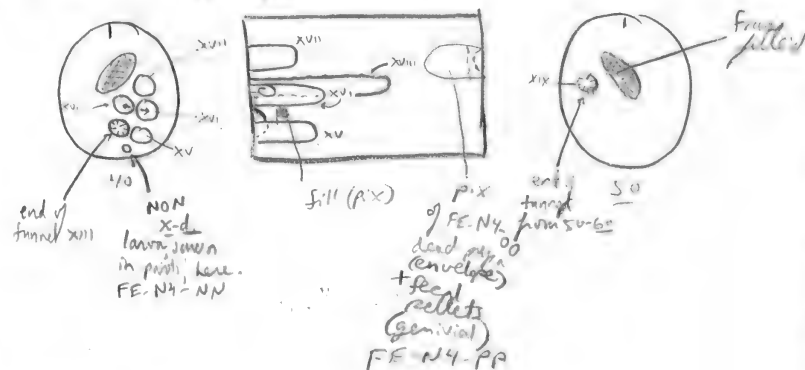
Kohls, Allen M., Charleston M. Clifford & Harry  
Hoogstraal. 1969. Two new species of  
Quintanodorus from the Galapagos Islands  
(Acari: Argasidae). J. Med. Ent. 6 (1): 75-78.

NOTE STEADY - P 211

"37 for too large now - if I can  
make it grow, - fast at night & slow by day (let it)  
be small & make it grow of itself in 10 days or so."

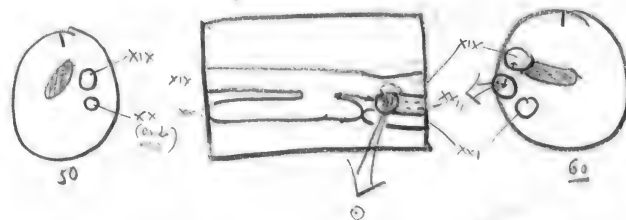
Fernandina Nest 4, cont'd

40.50 cm. (no opening to outside)



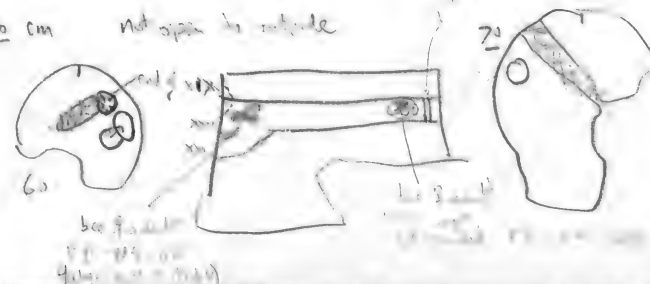
56-60

opening @ 57 cm



60.70 cm

Not open to students



No.	Description	Status			Remarks
		✓(01)	✓(02)	✓(03)	
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22	...				
23	...				
24	...				
25	...				

13. ...

No.	Description	Status			Remarks
		✓(01)	✓(02)	✓(03)	
1	...				
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X.d?	Number	Name (Fam)	Locality	Zone	Specimen	Notes	Other	X.d?	Notes	Other
	✓	...		T.M.				51	X	
		...		T.M.				52		
		...		T.M.				53		
		...		A				54		
		...		P				55		
		...		T				56		
		...		T.M.				57		
		...		T				58	X	
		...		T.M.				59		
		...		T.M.				60		
		...						61	X	
		...						62	X	
		...						63		
		...						64	X	
		...						65	X	
		...						66	X	
		...						67	X	
		...						68	X	
		...						69	X	
		...						70	X	
		...						71	X	
		...						72	X	
		...						73	X	
		...						74	X	
		...						75	X	

		Specimens	Pollen
Silene	1002	1002	76
	1003	1003	77 X
	1004	1004	78
	1005	1005	79 X
	1006	1006	80 X
	1007	1007	81 X
	1008	1008	82
	1009	1009	83
	1010	1010	84
	1011	1011	85
Agrostis	1012	1012	86
	1013	1013	87
	1014	1014	88
	1015	1015	89
	1016	1016	90 X
	1017	1017	91 X
	1018	1018	92 X
	1019	1019	93 X
	1020	1020	94 X
	1021	1021	95 X
Triticum	1022	1022	96
	1023	1023	97
	1024	1024	98
	1025	1025	99
	1026	1026	100
	1027	1027	101
	1028	1028	102
	1029	1029	103
	1030	1030	104
	1031	1031	105





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GALAPAGOS ISLANDS:  
Santa Cruz (Indefatigable).  
Dec. 1900.  
R. Perry & J. de Vries.  
S.M. 1800-17.  
Ref. No. L.

Superficially compared  
with CDRS REF. No. (by RS)  
AT C. Darwin. Also. 18. (by RS)  
Consult Station notes  
and S. V. N. H. material.

Design. a card  
no. 10. 1000000!  
to be.



83

GALAPAGOS ISLANDS  
 Santa Cruz (Indefatigable).  
 Dec. 1958.  
 R. Perry & T. de Vries.  
 B.M. 1958-17.  
 Ref. No. L.

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P. 1



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RA

RS

SI

SI

RS

22 May 1970

ISLA PINZÓN (= Duncan)  
*Xylocopa darwini*,  
 OLD NESTS 1 (upper)  
 and 2 (lower), in  
*Cordia lutea* (old but  
 standing dead trees).  
 Collected between 50 and  
 100 m, above anchorage at  
 small island, to north  
 of streambed. 14 May 1970.  
 R. Silberglid.

(easy. get from photos)

NEST 1 - terminal in branch, one lateral opening,  
 single tunnel continues down to end ~1.5 cm,  
 and up to break of branch

NEST 2 - terminal in branch, forked



28 May 1970

FILM MAILER NUMBERS

(MOTION PICTURE)

B 460544	Champion → Central Islands Trip
B 460485	MT. CROCKER TRIP
B 460486	MT. CROCKER TRIP
B 460487	MT. CROCKER TRIP
B 460488	MT. CROCKER TRIP
B 460511	MT. CROCKER TRIP
B 460513	(LAST OF) MT. CROCKER TRIP



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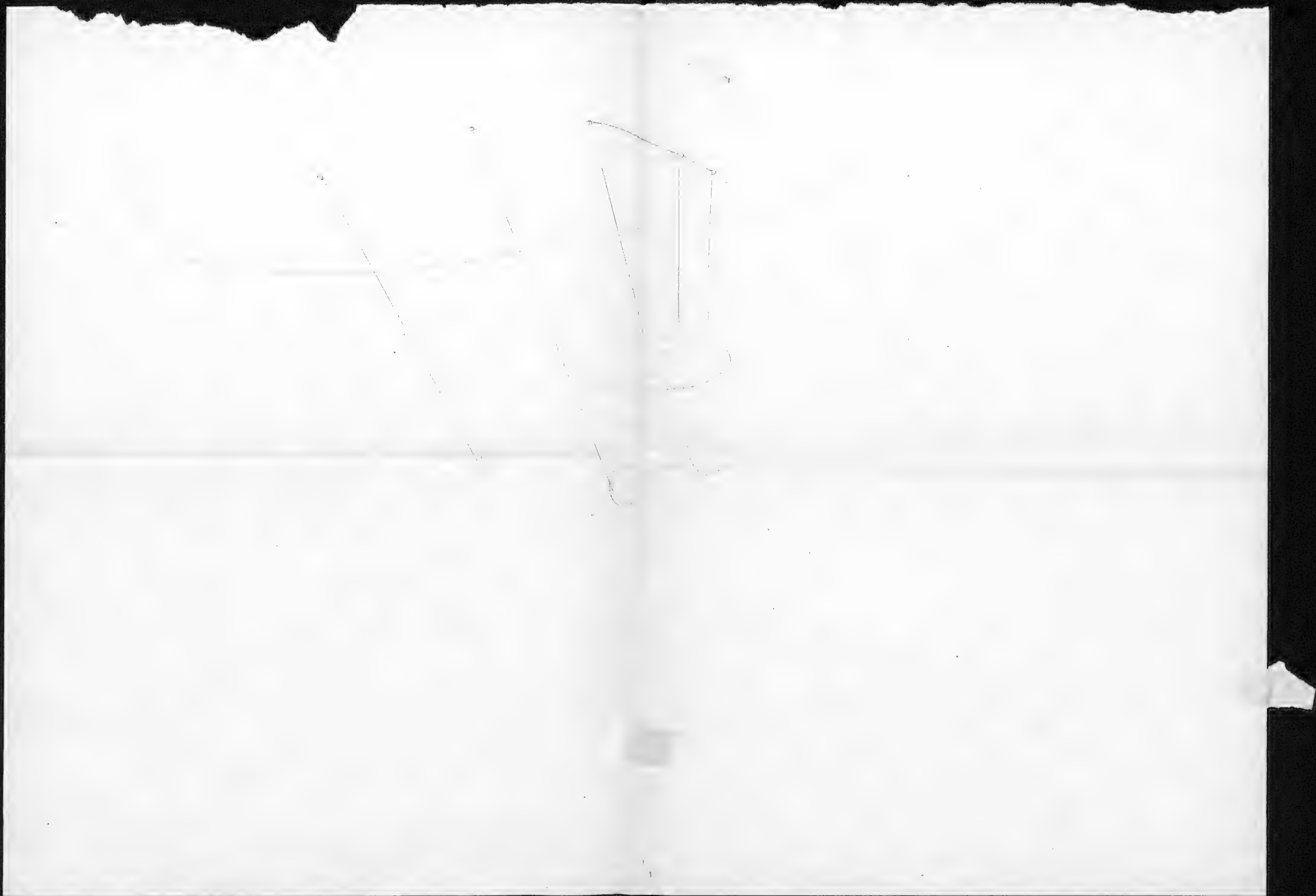
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~~24~~

24 INCISA

-TR

25 INCISA

PP

26 RETRO FLEXA

Puerto Muñoz

27 HELLER SANTACRUZIANA

TB

28 HELLER HELLER

BA

29

RS (myself)

CA Carmen Angermeyer

SI Syuzo How

DW David Wiken

RP Roger Perry

FS Frank Sullivan

RA

RS

SI

DW &amp; SI

FS

ISLA PINZÓN (= Duncan)  
 Xylocopa darwini,  
 OLD NESTS 1 (upper)  
 and 2 (lower), in  
 Cordia lutea (old but  
 standing dead trees).  
 Collected between 50 and  
 100 m, above anchorage at  
 small island, to north  
 of streambed. 14 May 1970.  
 R. Silberglieb.

22 May 1970

(easy. get from photos)

NEST 1 - terminal in branch, one lateral opening,  
 single tunnel continues down to end ~1.5 cm,  
 and up to break of branch

NEST 2 - terminal in branch, forked



28 May 1970

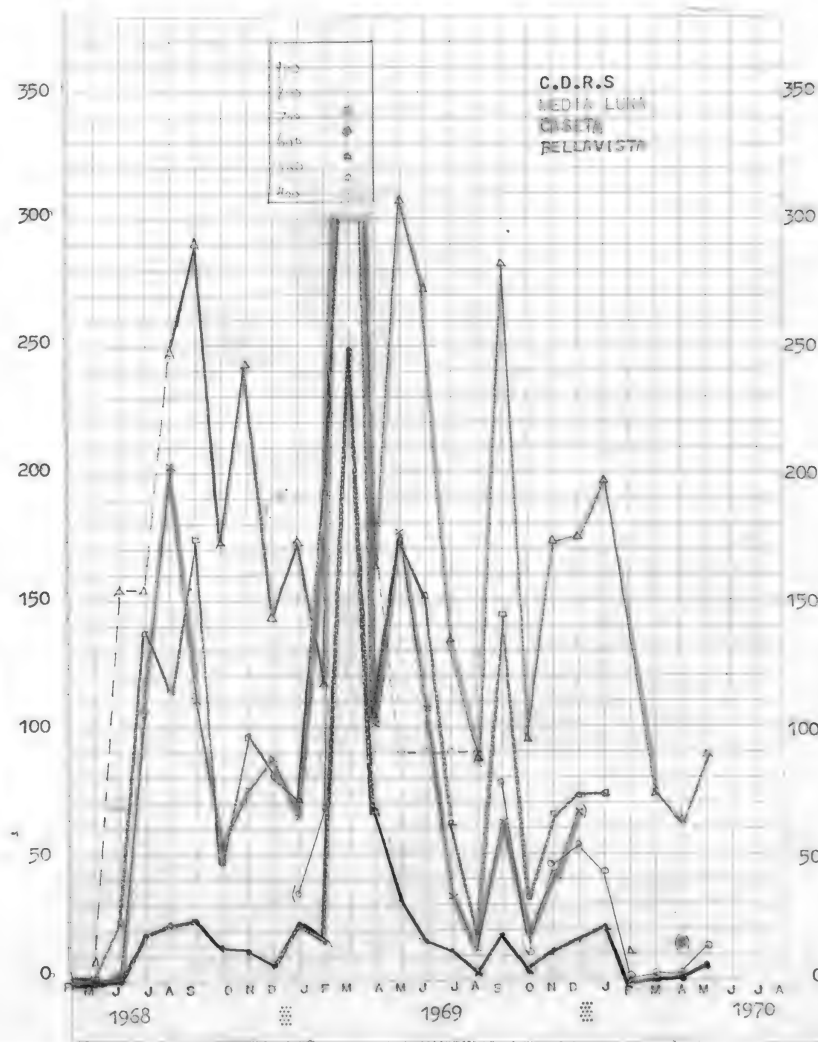
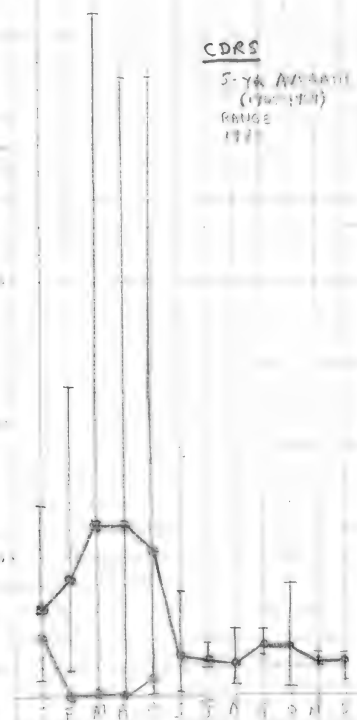
FILM MAILER NUMBERS

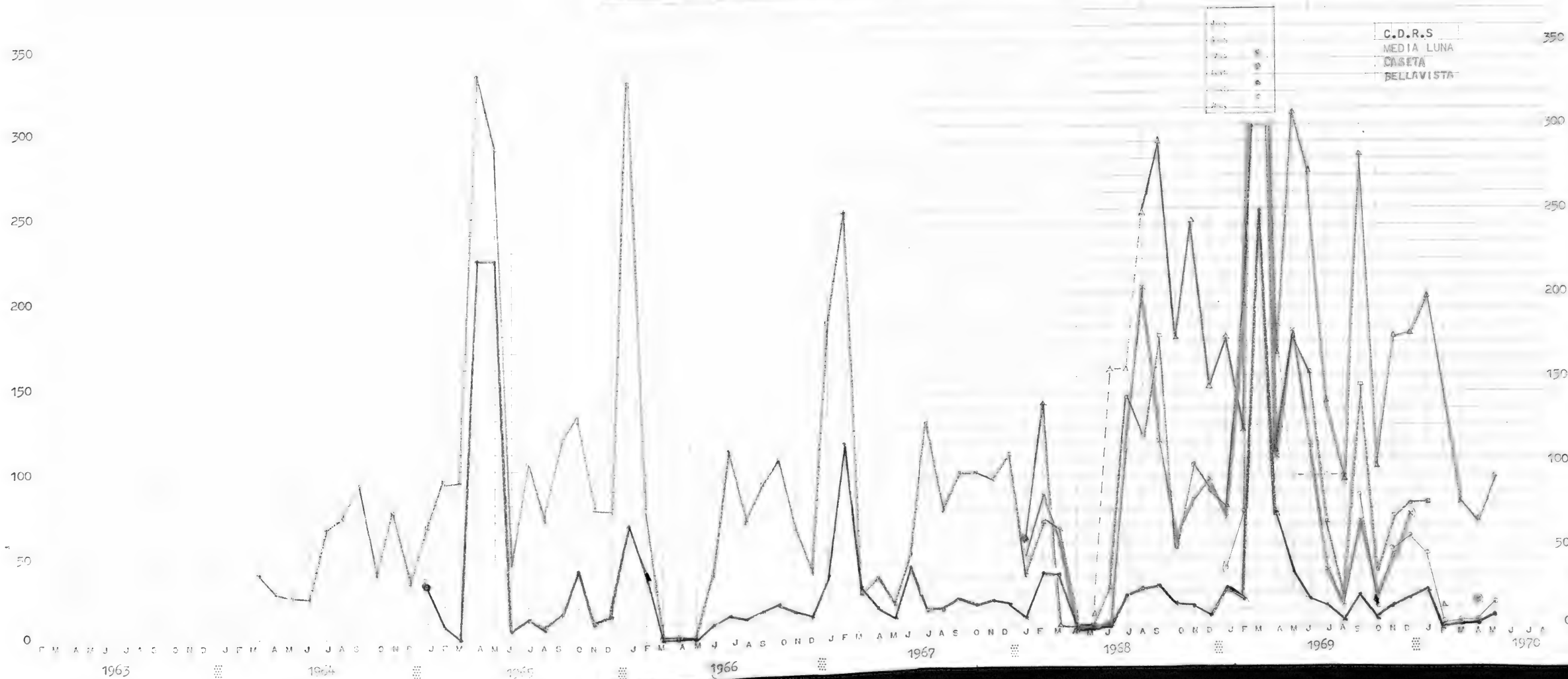
(MOTION PICTURE)

B 460544	Champion → Central Islands Trip
B 460485	MT. CROCKER TRIP
B 460486	MT. CROCKER TRIP
B 460487	MT. CROCKER TRIP
B 460488	MT. CROCKER TRIP
B 460511	MT. CROCKER TRIP
B 460513	(UNIT 05) MT. CROCKER TRIP

RAIN GAUGE DATA FROM VARIOUS GALÁPAGOS STATIONS,  
COMPILED FROM VARIOUS OBSERVERS BY D. WEBER, C.D.R.S.  
(ALL FIGURES IN MM.) (\*OBSERVER) (MAXIMUM OBSERVED FOR YEAR)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL	
SANTA CRUZ: CHARLES DARWIN RESEARCH STATION (ALT. $\pm$ 5 M.)														(*C.D.R.S.)
1964	31.5	8.9	0.0224	6.224	2.2	6.3	12.7	8.8	16.2	40.2	11.7	16.5	601.6	
1965	69.7	41.8	0.0	0.0	0.0	9.0	13.8	10.4	15.6	19.1	14.0	10.6	203.4	
1966	34.6	112.0	26.9	13.8	7.9	37.5	10.6	10.9	17.5	13.7	16.5	13.3	315.1	
1967	5.7	31.9	30.2	0.0	0.1	1.0	18.2	22.7	23.5	14.1	11.7	6.6	165.7	
1968	23.0	16.8	24.0	68.5	31.4	16.8	12.0	3.8	18.5	3.2	11.0	15.7	469.7	
1969	20.4	0.0	1.2	0.0	0.0									
1970														
1971														
1972														
SANTA CRUZ: "EL RANCHO" ( $\pm$ 1.5 KM. BEFORE IT) (ALT. 70 M.)														(*C.D.R.S.)
1969	35.1	67.6	77.5	180.3										
1970	41.9	0.0	1.9	2.5	12.8									
1971														
SANTA CRUZ: ESTACION METEO. DE BELLAVISTA (ALT. 170 M.) (VISION FRANCISCANA, *SR. ELISEO MARINO)														
1964	38.6	28.1	24.2	23.5	66.5	70.9	90.8	38.3	74.3	33.3			(488.5+)	
1965	66.9	92.1	91.8	374.0	291.9	46.3	104.6	70.5	119.0	133.9	77.9	79.4	1,508.3	
1966	311.5	79.3	1.7	2.3	1.5	39.7	111.8	69.3	90.1	104.8	62.0	38.2	912.2	
1967	185.6	250.1	24.8	30.5	15.4	44.0	122.7	70.6	92.4	92.3	88.4	103.4	1,120.2	
1968	31.5	61.5	58.4	0.0	0.0	23.5	137.9	115.8	173.7	48.5	95.4	80.4	826.6	
1969	70.6	192.7	545.4	105.2	174.6	151.3	62.1	18.2	143.7	31.7	66.3	72.0	1,633.8	
1970	72.0													
1971														
1972														
SANTA CRUZ: "WILLNIS" (ABOVE BELLAVISTA) (ALT. 200 M.) (*MME. HORNEMAN, ET. AL.)														
1963	211.2	163.7	50.2											
1964	43.5	119.6	35.5	531.6	346.2	53.2	115.8	57.3	156.5	145.7	86.5	79.4	1,590.8	
1965	308.6	125.9	0.0	3.0	4.7	46.5	112.1	90.3	101.4	118.6	81.4	44.7	1,037.2	
1966	188.6	264.8	20.5	22.1	10.8	24.1	137.3	88.7	121.7	115.6	87.4	107.9	1,289.5	
1967	28.6	42.7	76.0	0.0	0.0	21.0	134.7	84.1	1203.7	56.7	117.1	85.5	850.1	
1968	81.3	100.4	581.0	102.2	204.8	168.2	38.9	23.4	144.1	41.1	48.0	82.0	1,615.4	
1969														
1970														
1971														
1972														
SANTA CRUZ: "LA CASETA" (BELOW SANTA ROSA) (ALT. 200 M.) (*C.D.R.S.)														
1967	41.8	78.8	49.6	0.0	0.9	1.8	105.0	203.1	110.7	53.7	76.6	88.0	810.0	
1968	64.5	171.8	720.6	100.8	177.3	108.6	33.4	12.0	62.0	17.8	42.8	66.9	1,569.3	
1969														
1970														
1971														
1972														
SANTA CRUZ: DEVINE'S HOUSE (SANTA ROSA VIC.) (ALT. $\pm$ 300 M.) (*MR. DEVINE)														
1966	39.6	11.7	13.4	29.2	100.8	69.3	83.3	90.2						
1967	239.6	395.0	55.8	14.2	40.1	11.4	79.9	32.2	45.9	58.8	49.5	62.2	1,079.6	
1968	56.1	95.0	58.9	2.0	1.5	11.2	106.2	101.6	130.6	44.2	78.5	98.7	784.5	
1969	78.0	155.2	2920.8	79.5	214.6	147.3	42.2	13.7	90.9	22.6	52.8	84.1	1,901.7	
1970														
1971														
1972														
SANTA CRUZ: MEDIA-LUNA														
1968	51.7	132.0	0.0	0.0	0.0	7.8								
1969	172.6	117.0	666.2	166.4	309.8	271.1	8135.6	89.4	282.6	96.5	172.7	175.3	2,616.4	
1970	198.8	10.2	73.7	63.5	89.5									
1971														
1972														





TRICHROMATIC SEPARATION CHARACTERISTICS  
WITH ZEISS UV-366NM LENS AND FILTERS  
WITH FLASH AT X100 IN THE INDICATED  
POSITION, 1 SMALL TUBE, AND CORRECTION  
AS NECESSARY:

UV-366NM FILTER F11-22 (F AT FILM PLANE)  
47D WRATTEN FILTER F 8-16 (F AT LENS)  
57A WRATTEN FILTER F 8-16 (F AT LENS)

XYLOCOPA DARWINI  
NEST FROM BELLAVISTA,  
ISLA SANTA CRUZ;  
IN FALLEN BALSA, AT  
BEGINNING OF NEW  
TRAIL TO ACADEMY BAY.  
1.6 M. ABOVE GROUND.  
27 MAY 1970. (SILBERGLIED)

НИКОЛАЙ БИЛ. ПИ. БОЛДОВИЧ

МОНТЕВИДЕО, УРГУВАЙ

ПРЕДСТАВИТЕЛЬСТВО

АДРЕС: МОНТЕВИДЕО, УРГУВАЙ



TRICHOPTIC GENERATION CHARACTERISTICS  
 WITH ZEISS UV-366NM LENS AND FILTERS  
 WITH PLATE AT X100 IN THE INDICATED  
 POSITION. 1. WALL TO THE END OF STEM  
 AS INDICATED.

UV-366NM FILTER F 2-10 (F AT FILM PLATE)  
 40X OBJECTIVE FILTER F 2-10 (F AT LENS)  
 50X OBJECTIVE FILTER F 2-10 (F AT LENS)

XYLOCOPA DARWINI  
 NEST FROM BELLAVISTA,  
ISLA SANTA CRUZ,  
 IN FALLEN BALSA, AT  
 BEGINNING OF NEW  
 TRAIL TO ACADEMY BAY.  
 1.6 M. ABOVE GROUND.  
 27 MAY 1970. (SILBERGLIED)

PHOTOGRAPHED BY J. SILBERGLIED

MADE IN THE U.S.A.

PRINTED IN THE U.S.A.

ALBANY, NEW YORK 12206

SYNCHRONIC CHARACTERISTICS  
 173 TUBE UV-2000, 174 UV-2000  
 175 TUBE AT 1000 IN THE 1000-1000  
 176 TUBE, 1 TUBE, 1 TUBE, 1 TUBE  
 177 TUBE, 1 TUBE, 1 TUBE, 1 TUBE

UV-2000 FILTER F-11-22 (F AT FILM PLATE)  
 174 TUBE FILTER F-11-22 (F AT FILM PLATE)  
 175 TUBE FILTER F-11-22 (F AT FILM PLATE)

XYLOCOPA DARWINI  
 NEST FROM BELLAVISTA,  
ISLA SANTA CRUZ,  
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 27 MAY 1970. (SILBERGLIED)

PROVIDED BY THE U.S. AIR FORCE

173 TUBE UV-2000, 174 UV-2000

175 TUBE AT 1000 IN THE 1000-1000

176 TUBE, 1 TUBE, 1 TUBE, 1 TUBE

1

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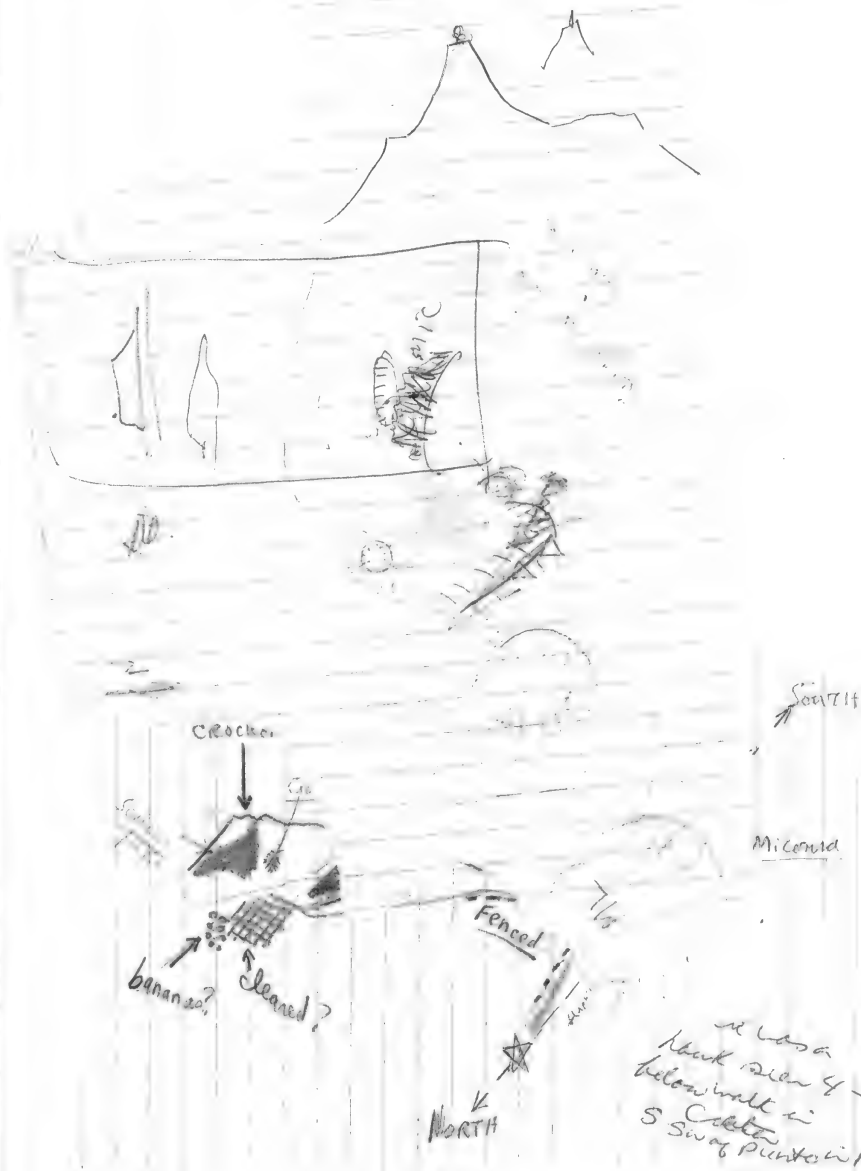
6

7

Utetheisa galapagensisTournefortia pubescens

2-10-10 10-10-10

	FIX	WASH	WASH	FIX	WASH
	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
1	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
2	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
3	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
4	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
5	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
6	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
7	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
8	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
9	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
10	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
11	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
12	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
13	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
14	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
15	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
16	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
17	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
18	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
19	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10
20	10-10-10	10-10-10	10-10-10	10-10-10	10-10-10



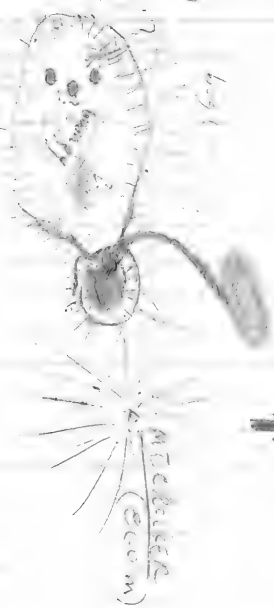
Transfers to COR3

+ 19 May (sent)  
+ 28 May (red)  
- 11

(Silbarglid)  
Chase Manhattan  
/

23 Feb (not food)  
(paid)

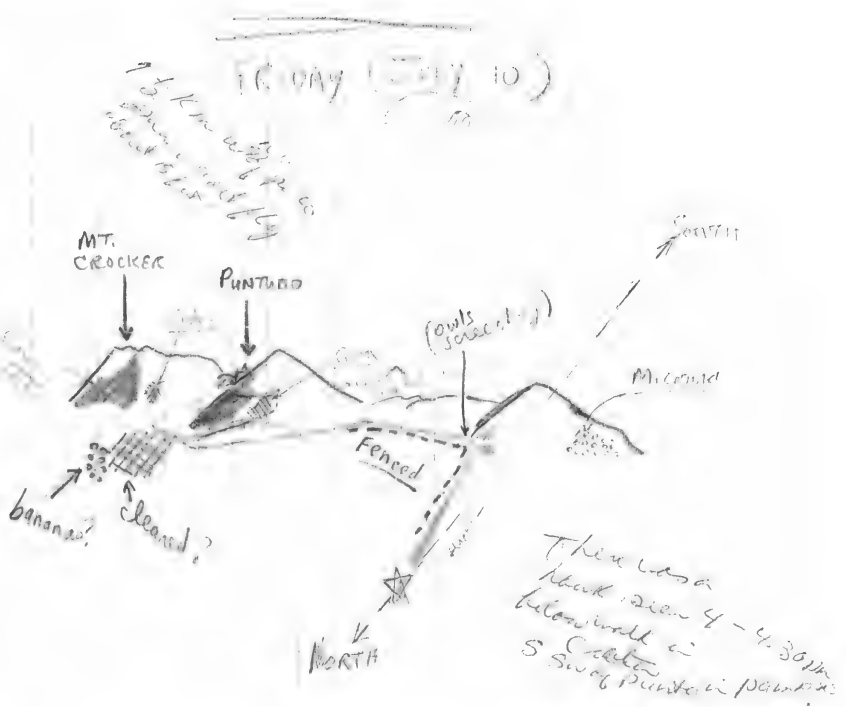
\$200.00



421

Friday 10. 1965

very dry (very hot) (very hot) (very hot)  
 very dry (very hot) (very hot) (very hot)  
 very dry (very hot) (very hot) (very hot)





not up / date

	<u>Xylocopa darwini</u>	♂♂	♀♀
Academy Bay, SANTA CRUZ			
Caseta, SANTA CRUZ	5		21
PLAZA	1		0
ALCEDO, Arid Zone, ISABELA			1
ALCEDO, Caldera Rim, ISABELA	5		8
Tagus Cove, ISABELA	0		6
FERNANDINA, North side			
James Bay, SANTIAGO			
JERVIS SOMBRERO CHINO			
DUNCAN			
SANTA FÉ			
Ternapin Road, SAN CRISTOBAL			
El Chino, SAN CRISTOBAL			
GARDNER NR HOOD			
Hood			
GARDNER NR CHARLES			
Las Cuevas, FLOREANA			
CHAMPION			
Black Beach, FLOREANA			



FEB 15 Boston → Miami  
 16 Miami → Guayaquil  
 17 Guayaquil → Baltra → Academy Bay  
 18 Academy Bay  
 19 Academy Bay  
 20 Academy Bay → Baltra → Academy Bay  
 21 Academy Bay  
 22  
 23  
 24  
 25  
 26  
 27  
 28  
 MAR 1  
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 4  
 5 Academy Bay  
 6 Academy Bay → S. Plaza  
 7 S. Plaza  
 8 S. Plaza → Academy Bay  
 9 Academy Bay  
 10  
 11  
 12

MAR 13 F

14 Sa

15 Su

16 M

17 Tu

18 W

19 O ACADEMY BAY → ~~ALCEDO~~ ALCEDO (Ascent)

20 F ALCEDO (to Geyser)

21 Sa ALCEDO (to NW rim)

22 Su ALCEDO (Descent) → Tagus Cove [UV]

23 M TAGUS COVE → PTA. ESPINOSA

24 Tu PTA. ESPINOSA

25 W PTA. ESPINOSA → N. SIDE FERNANDINA (Ascent)

26 O FERNANDINA (N. SIDE, others to rim + return)

27 F FERNANDINA (Descent) → PTA. ALBEMARLE [UV]

28 Sa PTA. ALBEMARLE → JAMES BAY

29 Su JAMES BAY → ALCEDO → JAMES BAY

30 M JAMES BAY

31 Tu JAMES BAY → JERVIS → SOMBRERO CHINO

APRIL 1 W SOMBRERO CHINO → DUNCAN

2 O Arrived ACADEMY BAY (moved to Station)

3 F ACADEMY BAY

4 Sa ACADEMY BAY

5 Su ACADEMY BAY

6 M ACADEMY BAY

7 Tu ACADEMY BAY



APRIL 8 W ACADEMY BAY

9 O ACADEMY BAY

10 F ACADEMY BAY → GARRINGTON [UV] BA

11 Sa GARRINGTON → PUNTA PITT [UV] BA, PP

12 Su PUNTA PITT → TERRAPIN RD [UV] PP, TR

13 M TERRAPIN RD TR

14 Tu TERRAPIN RD → "DARWIN SITE", SW. 1/4 TERRAPIN RD → WRECK BAY TR, WB

15 W WRECK BAY → EL CHINO → EL JUNCO [UV] WB, EC, EJ

16 O EL JUNCO → WRECK BAY EJ, WB

17 F WRECK BAY → GARDNER NR. HOOD [UV] WB, GH

18 Sa GARDNER NR HOOD → PTA. SHARZ → HOOD (SAY E. of PENINSULA) [UV] GH, PS, HO

19 Su HOOD → GARDNER NR CHARLES → LAS CUEVAS [UV] HO, GC, LC

20 M LAS CUEVAS → CHAMPION → POSTOFFICE BAY LC, CH, PO

21 Tu POSTOFFICE BAY → BLACK BEACH (→ CRUZ; WITTMER) PO, BB

22 W BLACK BEACH BB

23 O BLACK BEACH → ACADEMY BAY BB, DS

24 F ACADEMY BAY

25 Sa ACADEMY BAY

26 Su ACADEMY BAY

27 M ACADEMY BAY

28 Tu ACADEMY BAY

29 W ACADEMY BAY

30 O ACADEMY BAY

MAY

1 F ACADEMY BAY

2 Sa ACADEMY BAY

3 Su ACADEMY BAY

MAY 4

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(Total 44 + 44 = 88)

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MAY 30

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JUNE 1

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Jan 25

F 26

S 27

Su 28

M 29

T 30

July 1

Th 2

F 3

S 4

Su 5

M 6

T 7

W 8

Th 9

F 10

S 11

Su 12

M 13

T 14

W 15

Th 16

F 17

S 18

Su 19

M 20

to Medea Luna, Mirador

w/Dee  
Brewer towards Craters (E of Crocker)to Medea Luna, Mirador, micaria, <sup>to</sup> walk in crater (Agave)to Summit of Mt Crocker from West; then into crater <sup>(straw)</sup> in ridge <sup>(wood)</sup>

to Parity, then to Camote via El Camote, then to Belle Vista &amp; up again

lost W of camp; explored Mirador

to vic. Corolon, etc.

to Academy Bay

Pressed plants  
Lina A. Bob NansenMalin  
photographs

Received Passport via McFarland/Pitts

Dee left for Fernandez

R. Perry returned from Jumbo (McFarland to Capetan)

432

